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H. GILBERT

Dec. 27 1912

# Arco Wand Vacuum Cleaners

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**Installation and Plans**

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# Arco Wand Vacuum Cleaners

For Single Sweeper Plants only

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## Installation and Plans

Manufactured exclusively for  
American Radiator Company  
by Houston Manufacturing  
Company, Rockford, Illinois

*Issued exclusively for the use of the Trade by*

**AMERICAN RADIATOR COMPANY**

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(Issue corrected to January 1, 1912)



# Introductory

**I**N offering the Arco Wand Vacuum Cleaners we continue to adhere strictly to our long-established policy of selling only through the Trade. It is our belief that the sale of Arco Wand Vacuum Cleaners will prove to be an important addition to the installation work and consequent profits of our friends and patrons, with little added expense to their present business equipment. The field is new and large, and offers unusual opportunities to those who are willing to devote the necessary study and application of the principles laid down in this manual. There is immediate necessity for this book of fundamentals in so new an industry, and we rest confident in the belief that the Trade will appreciate the pains and expense to which we have gone to equip them with the reliable data herein. As the book is not likely to be reissued, we ask that this volume be carefully preserved.

Arco Wand Vacuum Cleaners are well made in all respects, have demonstrated their dependability under actual working conditions, and we recommend them to the Trade as efficient, reliable machines for accomplishing the results as set forth in these pages.

Arco Wand Vacuum Cleaners are manufactured and sold for single sweeper plants only. A single sweeper plant has capacity for the use of one line of hose, with one cleaner tool or sweeper at a time.

## Arco Wand Vacuum Cleaners

For Single Sweeper Plants only

### Construction Features

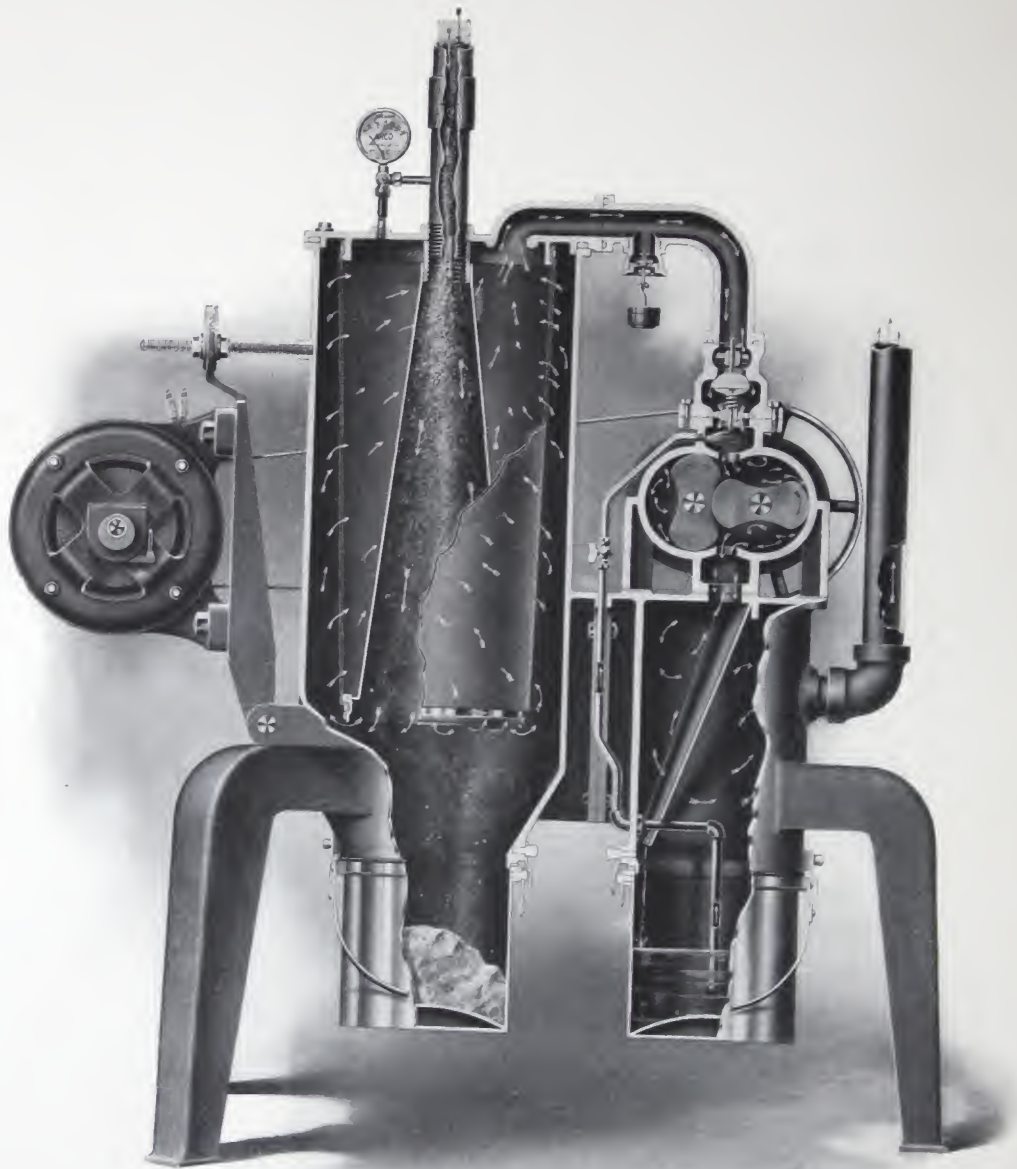
The dirt-laden air enters at the top of the separator through cleaner-main. Upon entering the sheet-metal funnel of the separator the air expands and its velocity is materially reduced, while the greater part of the dirt retains its high velocity and with the aid of gravity is precipitated into the dust bucket.

The currents of air after passing the lower edge of the sheet-metal funnel reverse their direction and move upward and pass through the cloth screen, as shown by the arrows. The screen is a double fabric, made of duck and muslin. It is cylindrical in form, the lower edge being bound to the lower edge of the sheet-

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*Arco Wand Vacuum Cleaners—Sectional View*

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*Sectional View of Arco Wand Vacuum Cleaner*

For description, see pages 3 and 5



### **Construction Features—Continued**

metal funnel, and the upper edge bound to the top of the separator. The screen effectually removes any light, flying dust carried by the air.

The condition of the screen in the separator can be tested at any time; and it can also be easily cleaned (See page 35, under the heading: "Testing the condition of screen in separator").

From the separator the air passes through the pipe connection to the pump, as shown by the arrows. A relief valve is provided in this pipe connection (See page 36, under the heading: "Vacuum Relief Valve").

Whenever the suction of the pump ceases, the check-valve, located just above the pump, seals and prevents in-rush of air to the separator and piping—all inlet couplings being closed. In "Cleaning the Screen" (see page 35) this check-valve reliably performs its important duty.

The pump produces a positive and continuous suction. It is rotary, of the cycloidal type, in which a pair of impellers like a two-tooth gear revolve within a casing. These impellers do not touch each other at any point, hence there is no friction or wear within the pump. The impellers and casing are constructed of material that will not rust.

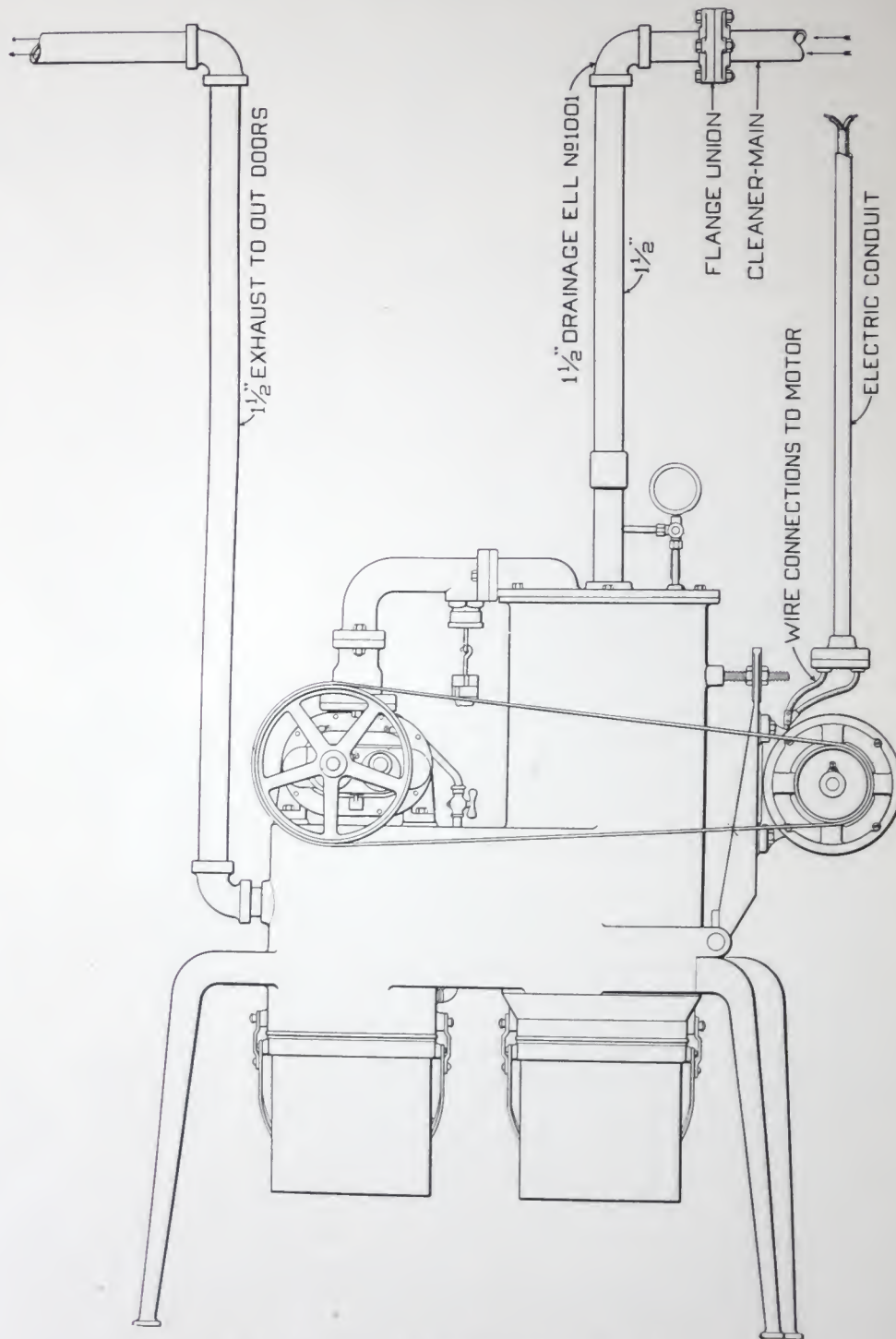
The two gears which drive the impellers have broad faces, are most accurately machined, and run in oil. The bearings, which are of liberal proportions, have bronze sleeves and are of the ring-oiling type. These rings automatically carry the oil to the bearings from large oil cisterns.

The air passes from the pump into the muffler, which prevents noise caused by its discharge from the pump. The air then passes through the exhaust pipe and is carried into a vent flue or outdoors. All air used in cleaning is removed from the building.

The bucket, attached to the muffler, carries water, a small supply of which circulates through the pump when in operation, closing the minute spaces between the parts to the passage of air, resulting in higher vacuum and greater efficiency. The pump when operating creates a suction through the small pipe. This causes water to flow from the bucket up through the small pipe, and it is delivered into the top of the pump with the in-rushing air. Passing through the pump it is discharged with the air into the muffler. Here the water is separated from the air and runs back into the bucket to be used again.

The motor, by means of a belt drive, transmits power to the pump. It is mounted on a bracket, which provides means for tightening the belt (See page 35, under the heading: "Belt").

## *Arco Wand Vacuum Cleaners—Method of Installation*

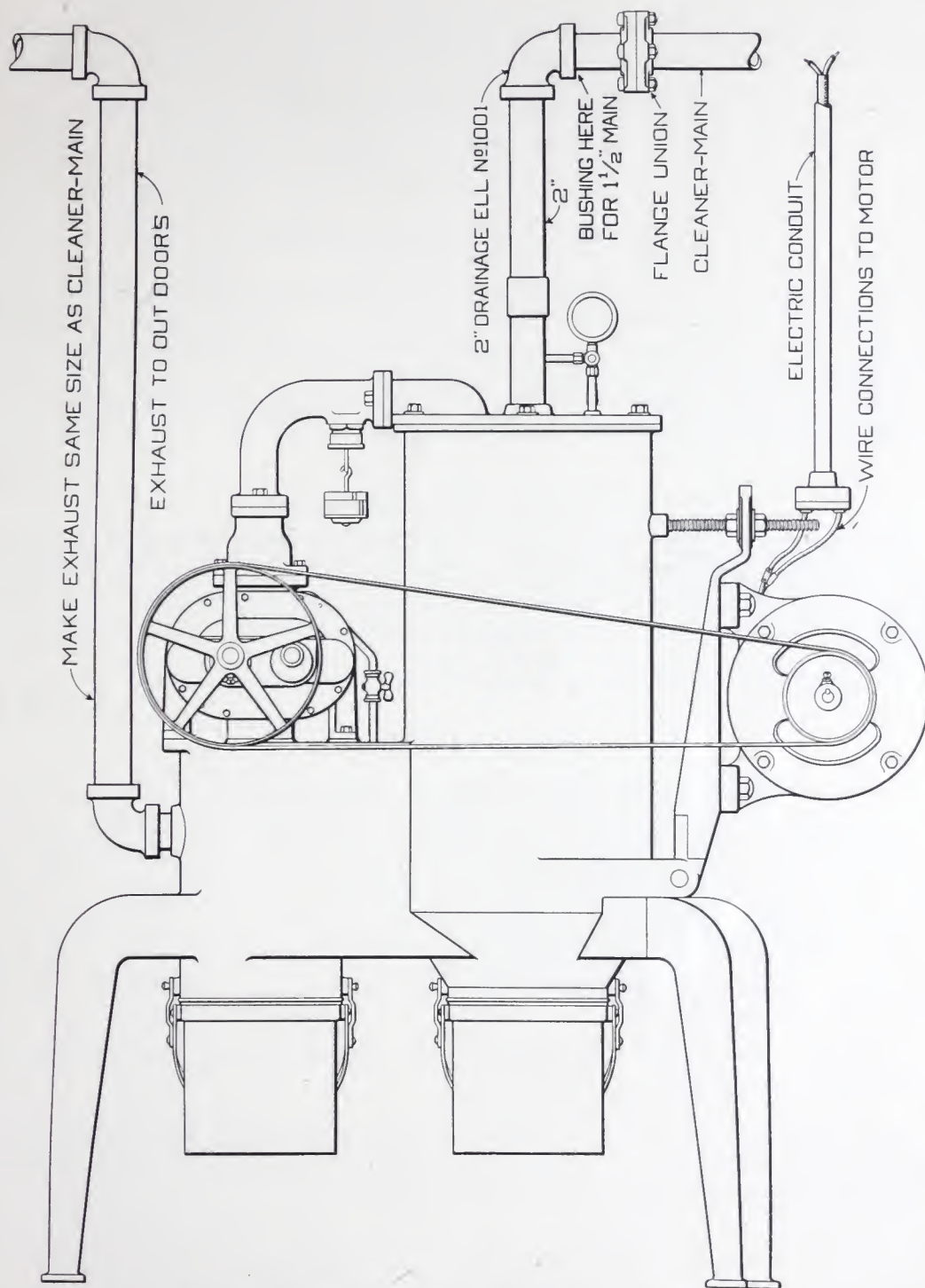


*No. 351 Arco Wand Vacuum Cleaner*

Shows way of connecting cleaner-main and exhaust, specifying pipe sizes. Also shows wire connections to motor.



## *Arco Wand Vacuum Cleaners—Method of Installation*



*No. 461 and No. 462 Arco Wand Vacuum Cleaners*

Shows way of connecting cleaner-main and exhaust, specifying pipe sizes. Also shows wire connections to motor.

## Space Required for Arco Wand Vacuum Cleaners

If the Cleaner is placed next to a wall, provide 15 inches space between the machine and the wall. Care should be taken to set the Cleaner machine level.

Preferably the belt side should be next to the wall.

The space required for each machine is as follows:

No. 350 Arco Wand Vacuum Cleaner: Length 36 inches; width 18 inches; height to top of Cleaner-main connection 52 inches.

No. 351 Arco Wand Vacuum Cleaner: Length 48 inches; width 18 inches; height to top of Cleaner-main connection 52 inches.

No. 460 Arco Wand Vacuum Cleaner: Length 50 inches; width 23 inches; height to top of Cleaner-main connection 63 inches.

No. 461 Arco Wand Vacuum Cleaner: Length 59 inches; width 23 inches; height to top of Cleaner-main connection 63 inches.

No. 462 Arco Wand Vacuum Cleaner: Length 61 inches; width 23 inches; height to top of Cleaner-main connection 63 inches.

## Pipe to be Used

Use black pipe, plugged and reamed, if it can be secured. Merchant black pipe may be used, but each length must be carefully examined to make sure that the inside is smooth and free from dents, kinks, fins or burrs. The ends of all pipe should be squared and reamed smooth to the full inside diameter.

Galvanized pipe should be used underground and in damp places.

## Sizes of Pipe

In connection with single sweeper plants, a run of piping (including cleaner-main and riser) not exceeding 60 feet in length from the most remote inlet coupling to the Vacuum Cleaner, should consist throughout of not smaller than 1½-inch pipe. A run of piping (including cleaner-main and riser) up to 250 feet in length, should consist of 1½-inch pipe for 60 feet from the most remote inlet coupling toward the machine, using 2-inch pipe for the remainder of the distance. Two-inch pipe can, of course, be used for a run of piping up to 250 feet in length. See the typical plans of piping, pages 11 to 28.

With Nos. 350 and 351 Arco Wand Vacuum Cleaners use 1½ inch pipe only for cleaner-main and risers.

Bent pipe can be used to advantage in many places instead of fittings. Care must be taken in erecting to observe instructions regarding use of couplings necessary with bent pipe (see third paragraph following).

## Fittings to be Used

Use Drainage Fittings on all cleaner-mains and risers. The inside diameter of these fittings through the body is the same as the inside diameter of pipe. The fittings should be free from all fins, burrs or rough places. For illustrations and lists of fittings see pages 16 and 17; also typical plans of piping, pages 11 to 28.



## Cleanout Plugs

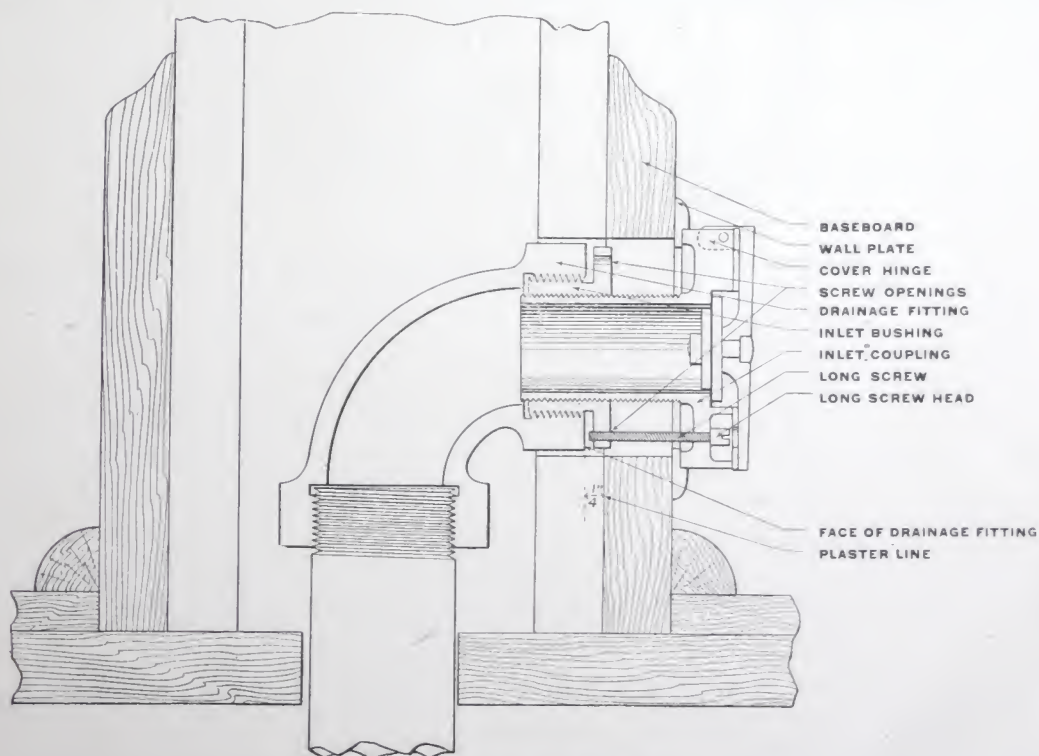
Cleanout Plugs, of same size as pipe, should be provided in horizontal cleaner-mains at turns and at base of risers. All tees and Y's, having cleanout plugs, must be so installed that the flow of dirt-laden air will be away from the plugs, never toward or against them. See typical plans of piping, pages 11 to 28. Cast-iron threaded plugs will answer. Brass plugs are preferred.

## Couplings and Flange Unions

Whenever a coupling or flange union is installed in a line of pipe, the ends of the pipe should be squared and reamed smooth to the full inside diameter. The threads should be made of sufficient length so that, when made up in a coupling or flange union, the two ends of the pipe will come practically together, furnishing a smooth passage for dirt-laden air, without recesses for burnt matches, hairpins or the like.

## Installing Inlet Couplings

FIRST: After applying red or white lead or pipe-joint paste to the male thread of the inlet bushing, screw it into the opening of the drainage fitting as far as possible, using the *Arco Bushing Wrench*. (See page 10.) The inlet bushing should be left in such a position that a vertical line will pass through the center of the

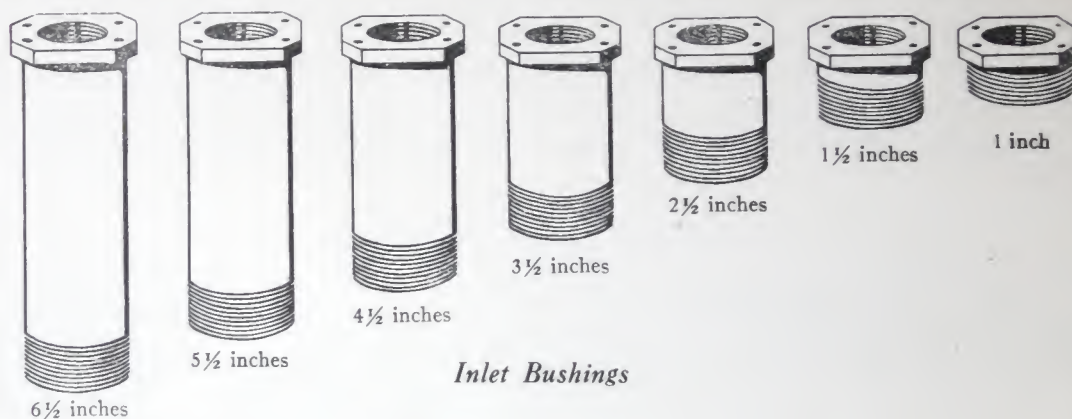


*Arco Inlet Coupling in place*

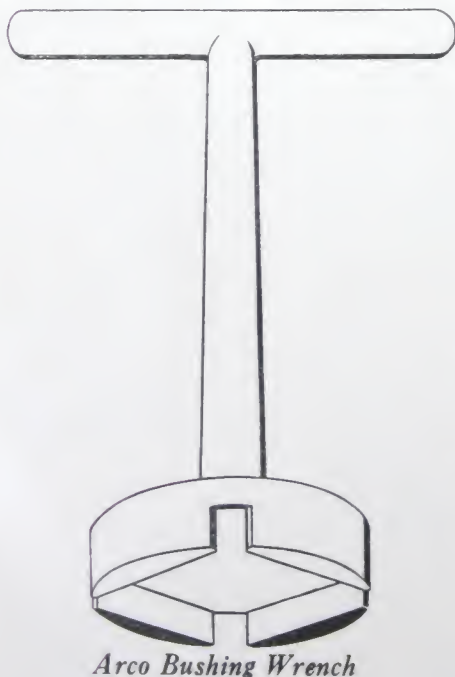
## Arco Wand Vacuum Cleaners—Method of Installation

middle opening and two of the small screw openings located in the corners of the *inlet bushing*. The inlet bushing is in this position whenever the handle of the Arco Bushing Wrench is in a horizontal or a vertical position.

SECOND: After applying red or white lead or pipe-joint paste to the male thread of the inlet coupling, and placing the wall plate in position, *screw by hand the inlet coupling* (the cover must be closed) into the inlet bushing until it draws the wall plate up firmly against the base-board, stopping when the cover hinge is at the top. The screw hole in the lower face of the inlet coupling should register with the corresponding opening in the inlet bushing. Insert the long screw and draw up snugly.



The head of the long screw should be entirely beneath the face of the inlet coupling, or the cover will not close. If the long screw is too long, cut it off with a hack saw. When the inlet coupling is in place the correct length for the long screw can easily be measured with a straight wire. Never turn the inlet coupling into place with the cover open—don't use it as a lever.



### Applying Red or White Lead or Pipe-Joint Paste

In the installation of piping for vacuum cleaning, always apply red or white lead or pipe-joint paste to the male threads of pipe and fittings. If applied in this way when the threads are made up all surplus lead or paste will be forced to the outside of the fittings and pipe, leaving the interior free from such substances.

Never apply lead or paste to female threads.



# Arco Wand Vacuum Cleaners—Typical Riser Plans

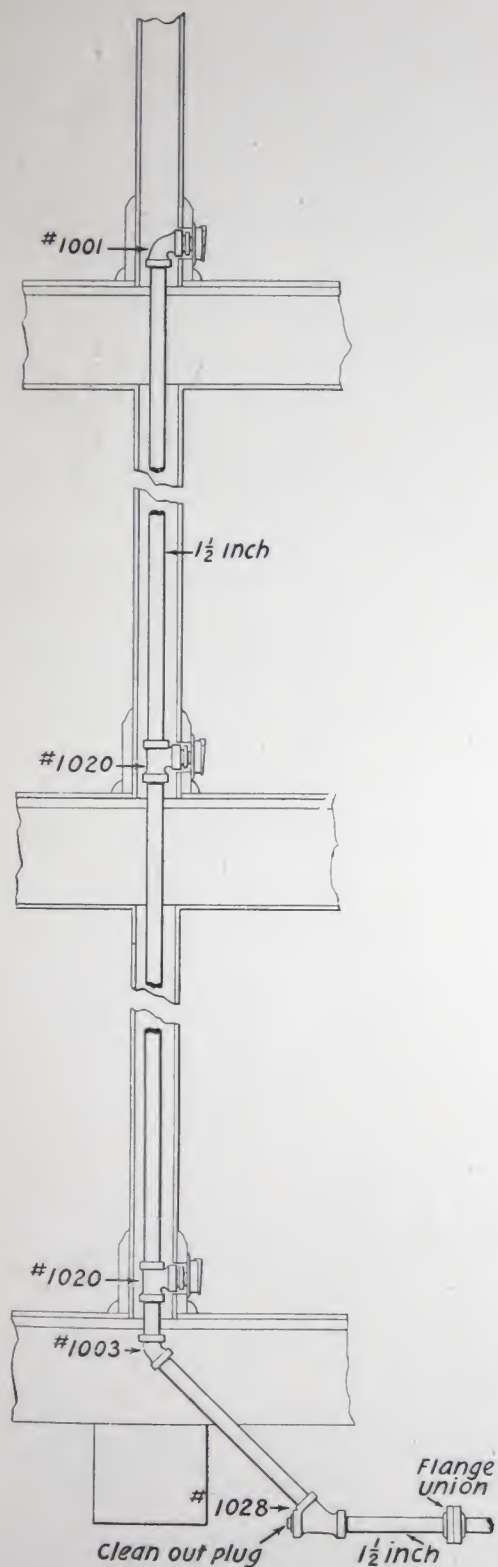


Figure 1—Typical riser, concealed in partition. One inlet coupling located in baseboard in each story.

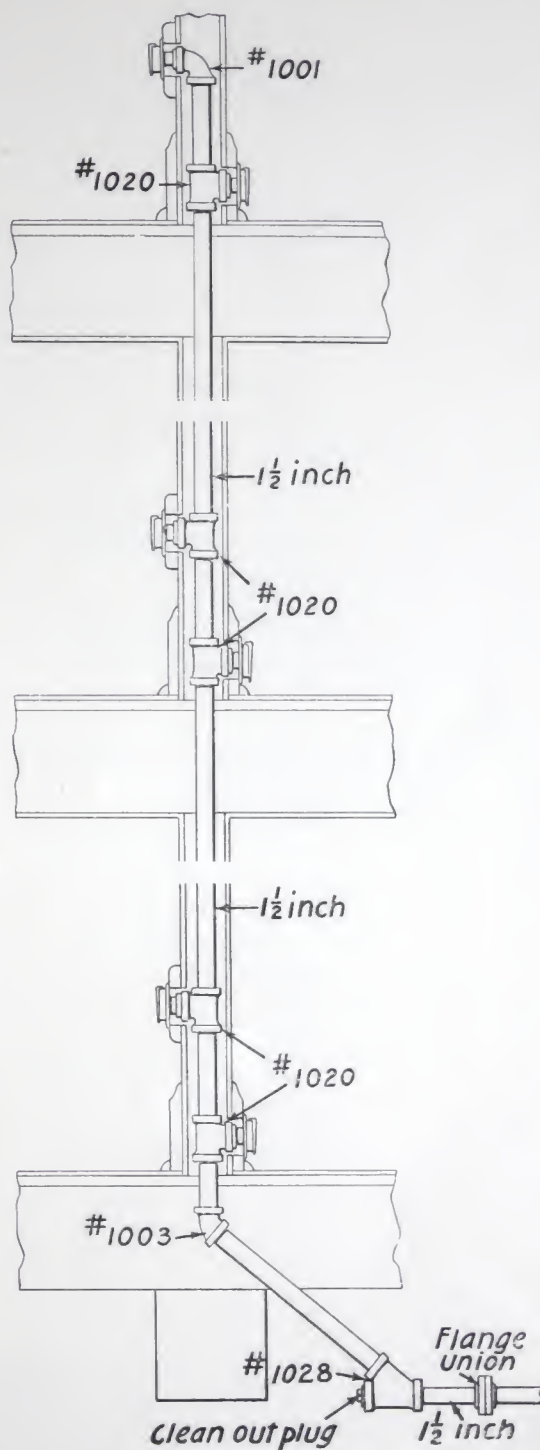


Figure 2—Typical riser, concealed in partition. Two inlet couplings in each story—one located in baseboard, and the other just above baseboard. A block, same finish as baseboard, should be provided for the inlet coupling.

## Arco Wand Vacuum Cleaners—Typical Riser Plans

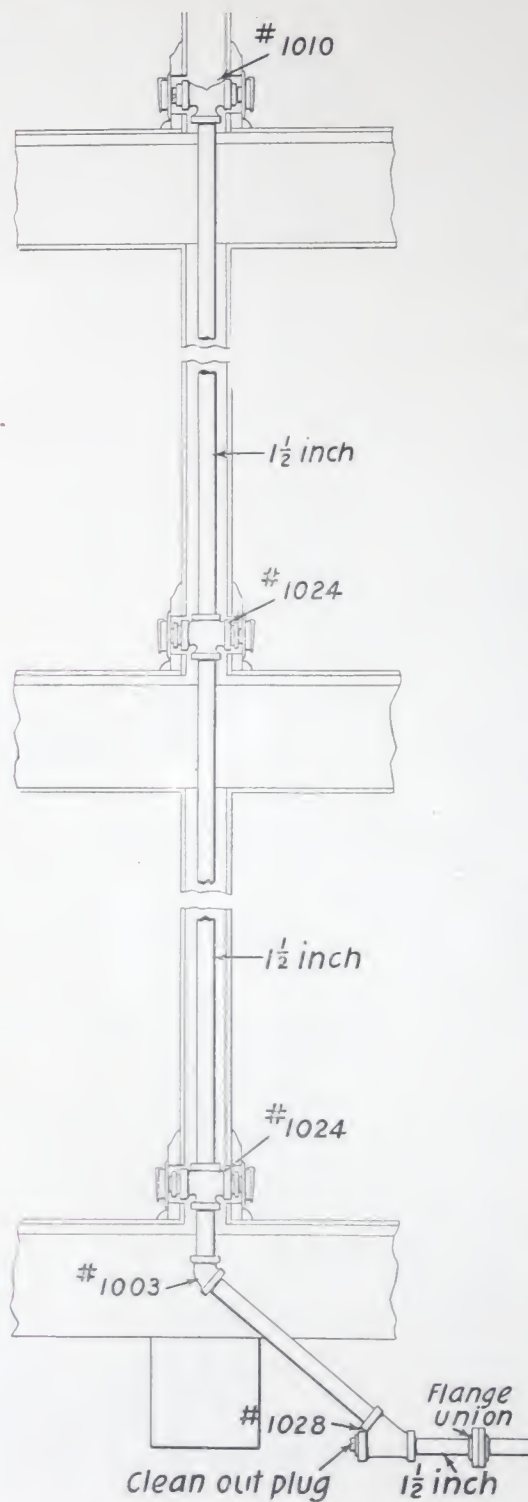


Figure 3—Typical riser, concealed in partition. Two inlet couplings located in baseboard in each story. The construction shown in this figure (3) should be used only in emergency.

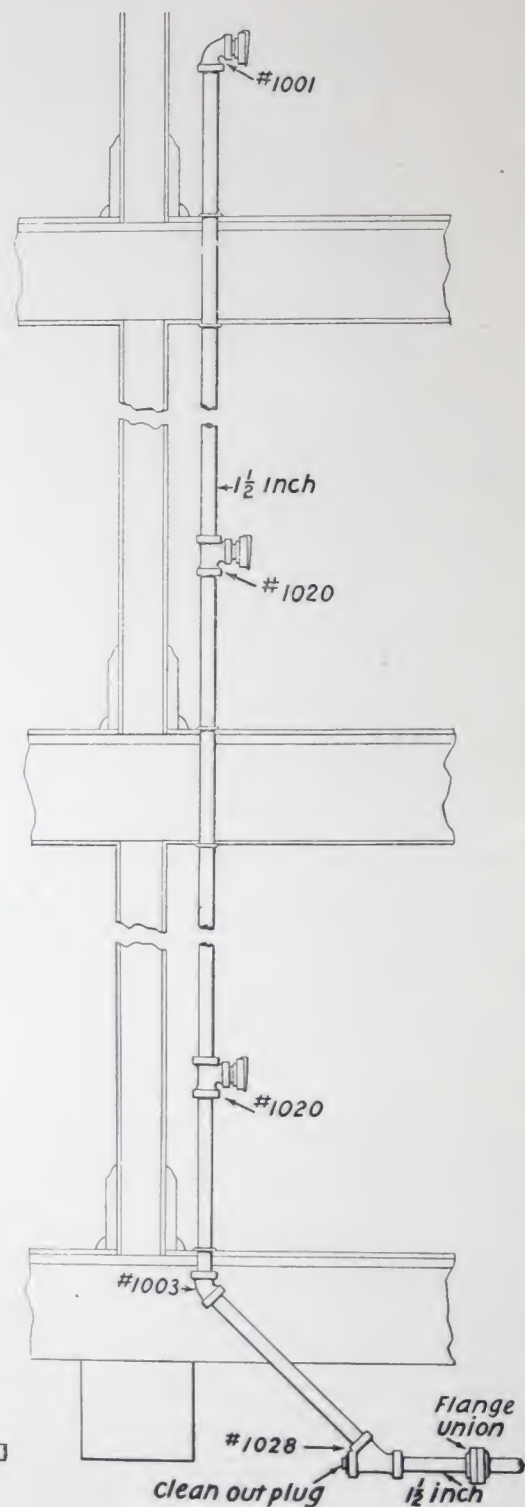


Figure 4—Typical riser, exposed in rooms, with one inlet coupling in each story. Inlet coupling to any riser may be located about 18 inches above the floor, making it easier to attach the hose without stooping.



# Arco Wand Vacuum Cleaners—Typical Riser Plans

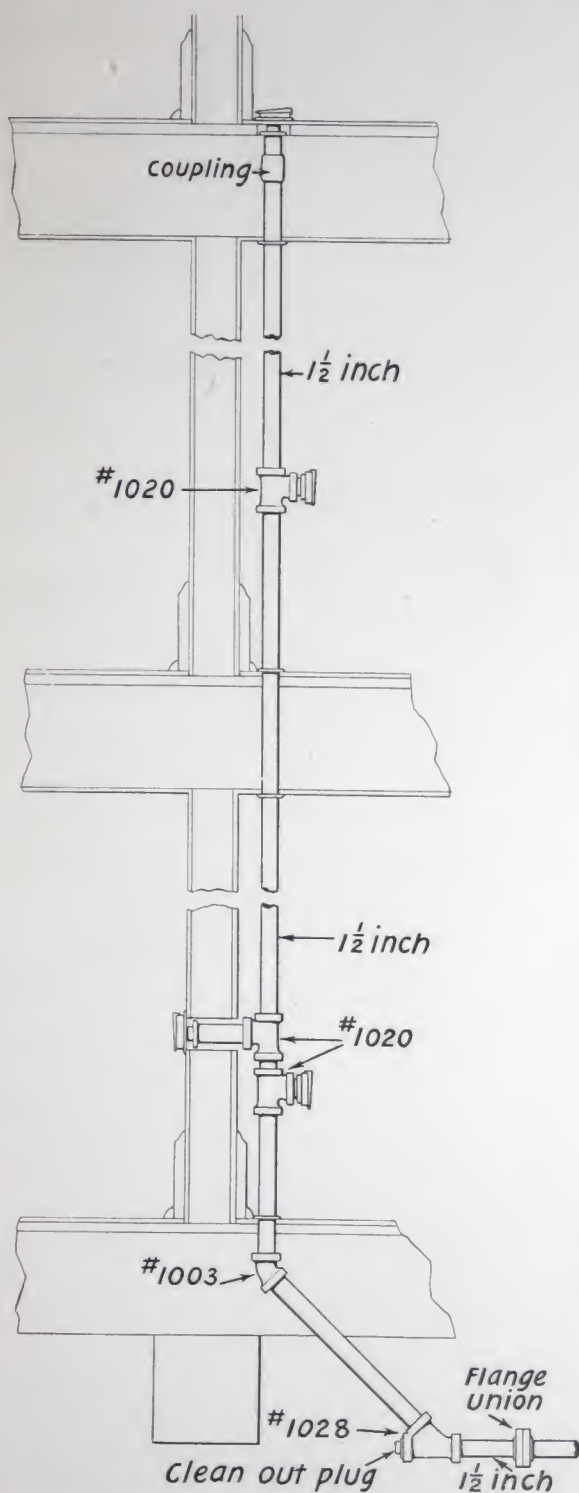


Figure 5—Typical riser, exposed in rooms, with two inlet couplings in first story, one inlet coupling in second story, and one inlet coupling in floor of third story.

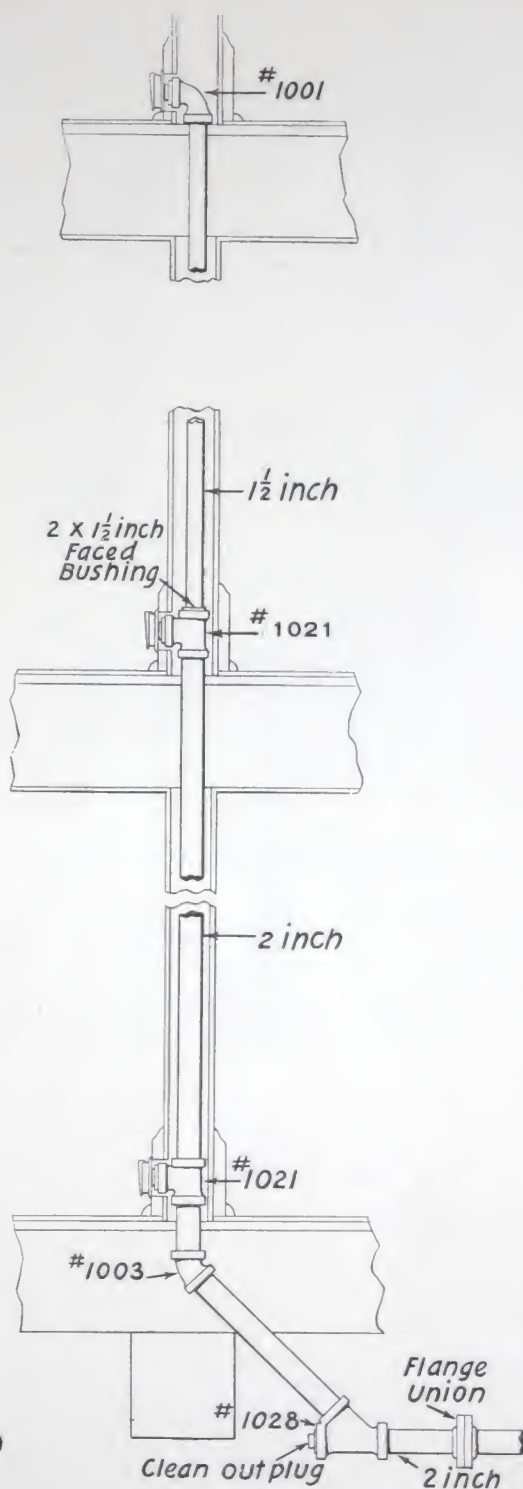
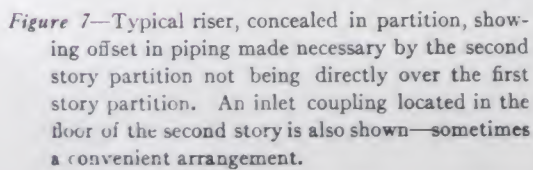
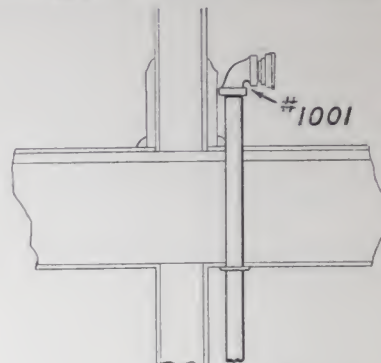


Figure 6—Typical riser, concealed in partition, showing method of bushing a fitting to enlarge the riser from 1 1/2-inch to 2-inch pipe—the 1 1/2-inch portion of the riser passing through a number of stories in the building and being 60 feet in length.

A technical drawing showing a cross-section of a concrete wall. A vertical anchor bolt, labeled #1001, is embedded in the wall. The bolt has a threaded section at the top, a smooth section in the middle, and a pointed section at the bottom. A nut and washer are shown at the top of the bolt, secured against the wall surface.



14



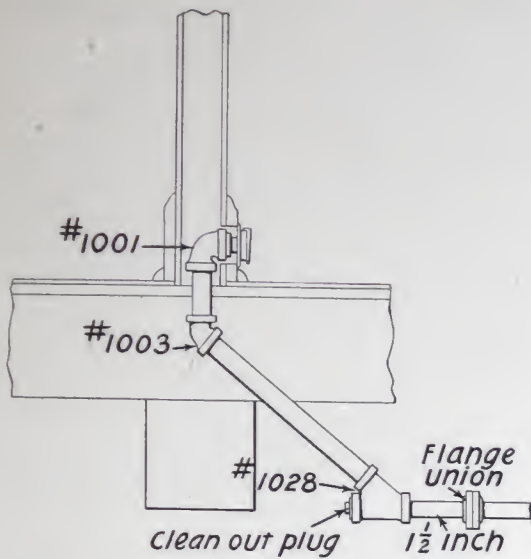


Figure 9—Typical connection to inlet coupling, located in baseboard of first story.

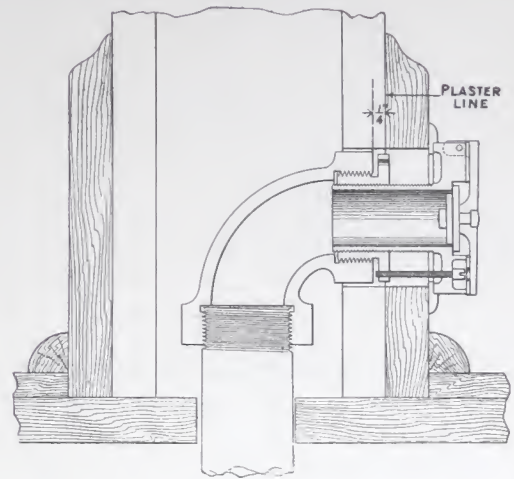


Figure 10—Shows inlet coupling in place. Also, drainage fitting, face of which is located  $\frac{1}{4}$  inch back of plaster line—which is recommended as the most suitable position. The opening through the baseboard should be  $2\frac{7}{8}$  inches diameter.

### Location of Drainage Fittings to Receive Inlet Couplings

When erecting risers located in partitions of buildings, the face of each drainage fitting into which an inlet coupling is to be screwed should be located, if possible, one-fourth inch back of the plaster line. Arco inlet bushings are made in seven lengths. (See page 10.) By using these inlet bushings, in connection with Arco inlet couplings, drainage fittings can be reached, the faces of which are located any distance not exceeding six inches back of the plaster line.

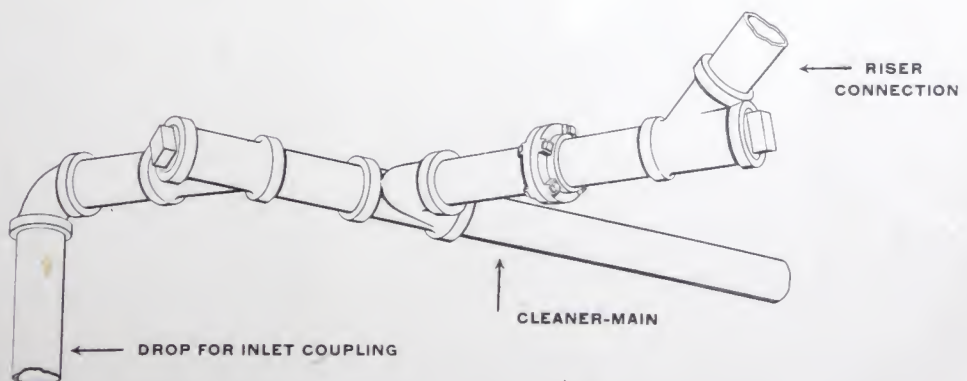
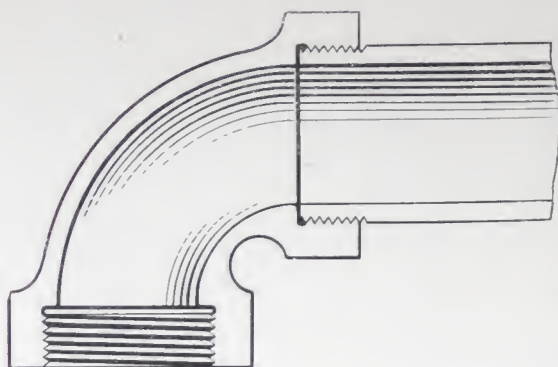


Figure 11. Section of Cleaner-Main—When it is necessary to drop a pipe for an inlet coupling located below the Cleaner-main, always make the connection from the side of the Cleaner-main, and never from the bottom—as bottom connection would fill with dirt.

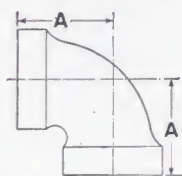


## Drainage Fittings, Cast Iron

### Screwed for Wrought Iron Pipe

These Fittings are made with a shoulder, and are the same size inside diameter as pipe

The pipe screws in up to the shoulder, making a continuous passage, leaving no pockets for the solid matter to lodge in, thus preventing choking up of the pipe. See note.



**90° Long Turn Elbows**  
No. 1001

Size.....	Inches	1½	2	2½
Dimensions A.....	Inches	2½	3½	3½
Price.....	Each	\$0.42	\$0.65	\$1.40



**45° Elbows**  
No. 1003

Size.....	Inches	1½	2	2½
Dimensions A.....	Inches	1¾	1¾	2¼
Price.....	Each	\$0.38	\$0.57	\$1.20



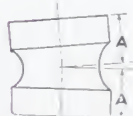
**22½° Elbows**  
No. 1005

Size.....	Inches	1½	2	2½
Dimensions A.....	Inches	1¾	1¾	1¾
Price.....	Each	\$0.38	\$0.57	\$1.20



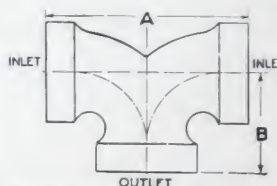
**11¼° Elbows**  
No. 1006

Size.....	Inches	1½	2	2½
Dimensions A.....	Inches	1¾	1¾	1¾
Price.....	Each	\$0.38	\$0.57	\$1.20



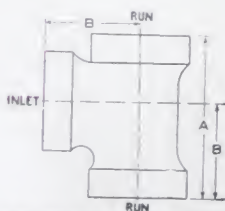
**5⅝° Elbows**  
No. 1007

Size.....	Inches	1½	2
Dimensions A.....	Inches	1¾	1½
Price.....	Each	\$0.38	\$0.57



**Three Way Elbows**  
No. 1010

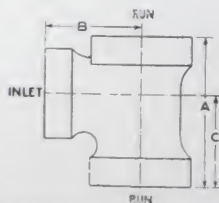
Size.....	Inches	1½	2
Dimensions A.....	Inches	5¼	6¼
Dimensions B.....	Inches	2⅝	3¼
Price.....	Each	\$0.85	\$1.10



**90° Y Branches**  
No. 1020 Tee Pattern

Size.....	Inches	1½	2	2½
Dimensions A.....	Inches	4¼	5¾	6¾
Dimensions B.....	Inches	2½	3¼	3¼
Price.....	Each	\$0.57	\$0.85	\$1.80

Above are taken from Crane Co's catalog.



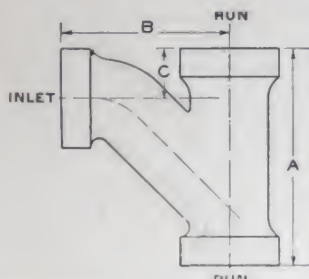
**Reducing 90° Y Branches**  
No. 1021 Tee Pattern

Size.....	Inches	2x1½	2½ x 1½
Dimensions A.....	Inches	4¾	4¾
Dimensions B.....	Inches	2¾	3¾
Dimensions C.....	Inches	2¾	2¾
Price.....	Each	\$0.95	\$2.00



## Drainage Fittings, Cast Iron

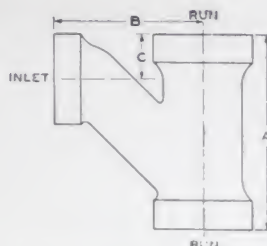
Screwed for Wrought Iron Pipe



90° Long  
Turn Y  
Branches

No. 1022  
Tee Pattern

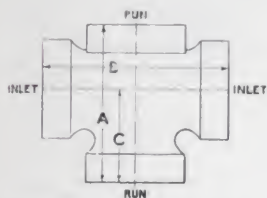
Size.....	Inches	1½	2	2½
Dimensions A.....	Inches	5¾	7⅞	8¼
Dimensions B.....	Inches	4⅞	5⅞	6¼
Dimensions C.....	Inches	1¼	1⅝	2
Price.....	Each	\$0.70	\$1.10	\$2.40



Reducing 90°  
Long Turn Y  
Branches

No. 1023  
Tee Pattern

Size.....	Inches	2x1½	2½ x 1½	2½x2
Dimensions A.....	Inches	5¾	5¾	7¾
Dimensions B.....	Inches	4¾	4⅞	5¼
Dimensions C.....	Inches	1⅝	1⅝	1⅝
Price.....	Each	\$1.20	\$2.65	\$2.65



Double 90° Y  
Branches

No. 1024  
Tee Pattern

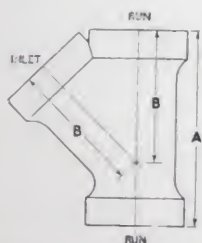
Size.....	Inches	1½	2	2½
Dimensions A.....	Inches	4¼	5⅞	6⅞
Dimensions B.....	Inches	5	6⅞	7¾
Dimensions C.....	Inches	2½	3⅞	3⅞
Price.....	Each	\$0.85	\$1.30	\$2.85



Double Reduc-  
ing 90° Y  
Branches

No. 1025  
Tee Pattern

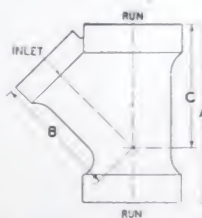
Size.....	Inches	2x1½	
Dimensions A.....	Inches	4⅝	
Dimensions B.....	Inches	5⅞	
Dimensions C.....	Inches	2½	
Price.....	Each	\$1.50	



45° Y Branches

No. 1028

Size.....	Inches	1½	2	2½
Dimensions A.....	Inches	5½	6⅞	7¾
Dimensions B.....	Inches	3¾	4⅞	5¾
Price.....	Each	\$0.65	\$0.95	\$2.10



Reducing 45°  
Y Branches

No. 1029

Size.....	Inches	2x1½	2½ x 1½	2½x2
Dimensions A.....	Inches	5⅞	6⅞	7⅞
Dimensions B.....	Inches	4⅞	4⅞	5¼
Dimensions C.....	Inches	4⅞	4⅞	4⅞
Price.....	Each	\$1.05	\$2.30	\$2.30

NOTE.—The 90-degree Long Turn Elbows No. 1001, Three-Way Elbows No. 1010, 90-degree Y Branches No. 1020 and No. 1021, 90-degree Long Turn Y Branches No. 1022 and No. 1023, Double 90-degree Y Branches No. 1024 and No. 1025 are regularly manufactured with pitch. We recommend them to be without pitch and they will be so furnished on special order.

Above are taken from Crane Co's catalog.

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*Arco Wand Vacuum Cleaners — Installation for Cottage*

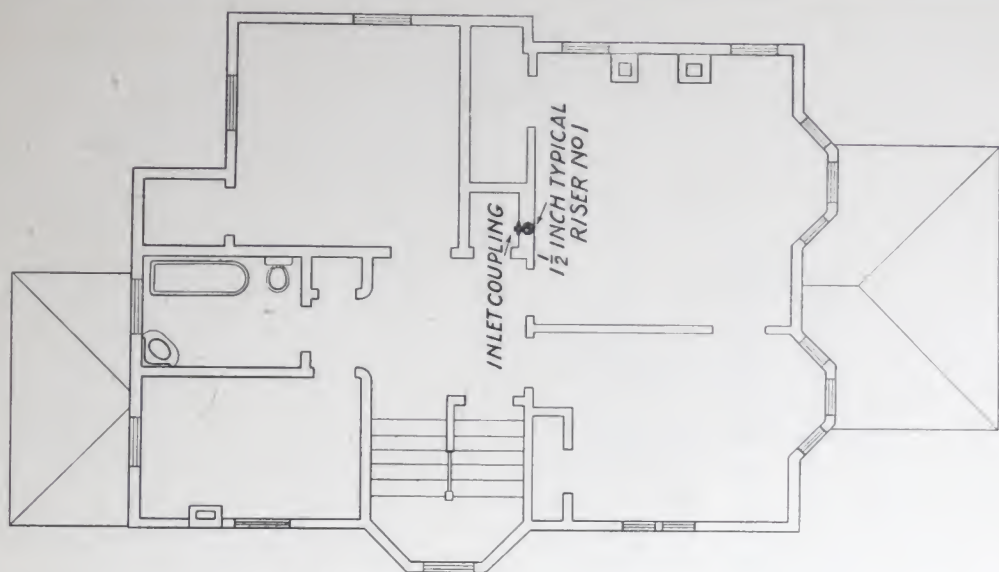
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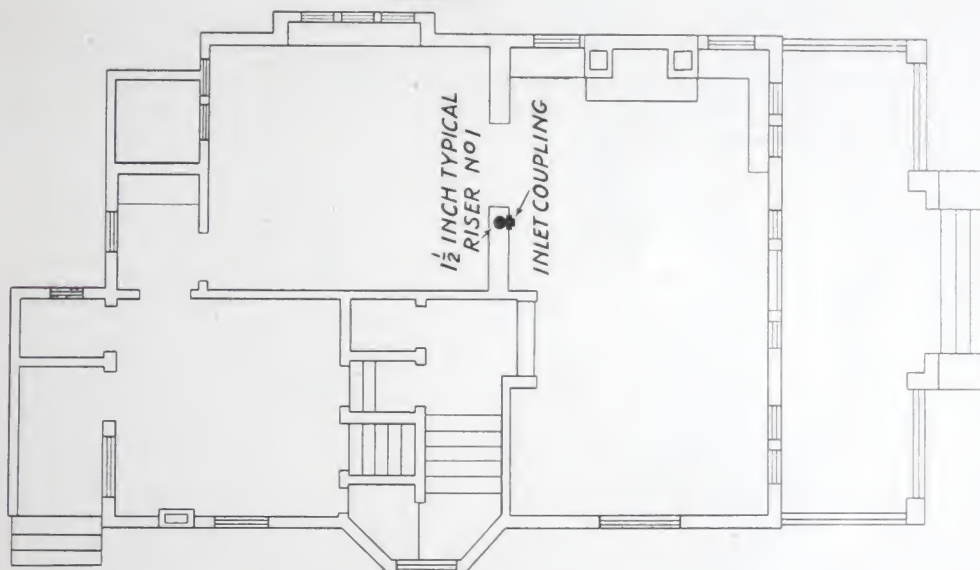
Sectional view of residence 30 x 36 feet, shows location of Arco Wand Vacuum Cleaner and elevation of piping. One Inlet Coupling on each floor for hose connection makes it possible to reach all parts of each floor with 25 feet of hose.



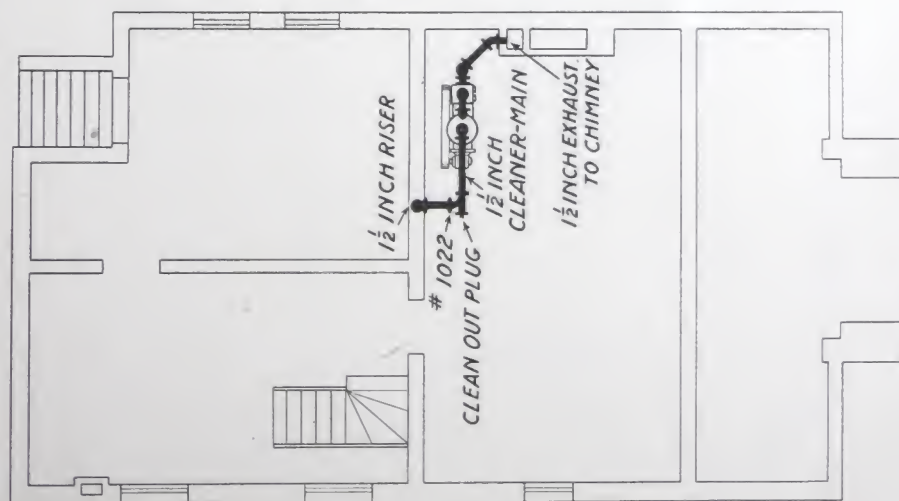
# Arco Wand Vacuum Cleaners—Installation for Cottage



**Second Floor**



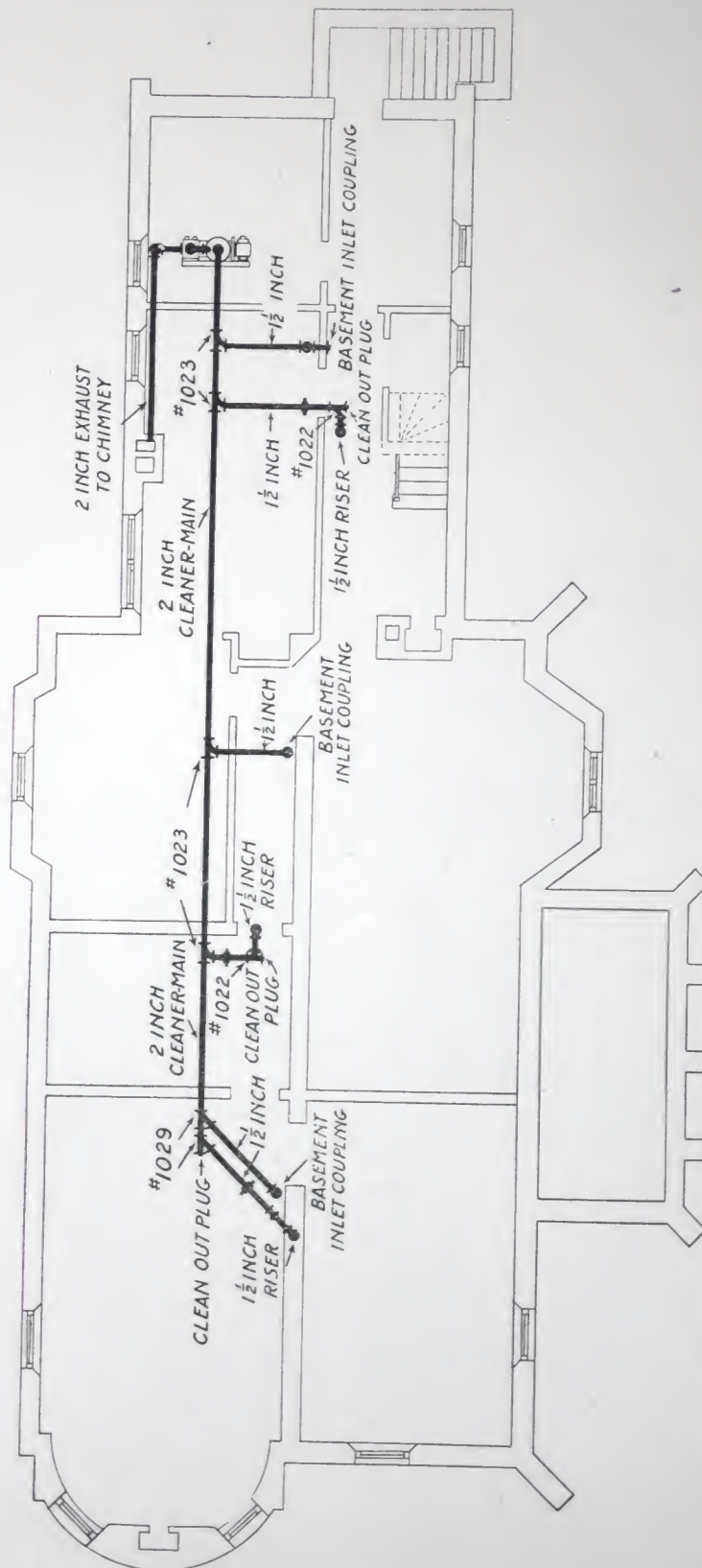
**First Floor**



**Basement**

Plans of a residence 30 x 36 feet. Basement plan shows location of Arco Wand Vacuum Cleaner and plan of piping. One Inlet Coupling on each floor for hose connection makes it possible to reach all parts of each floor with 25 feet of hose.

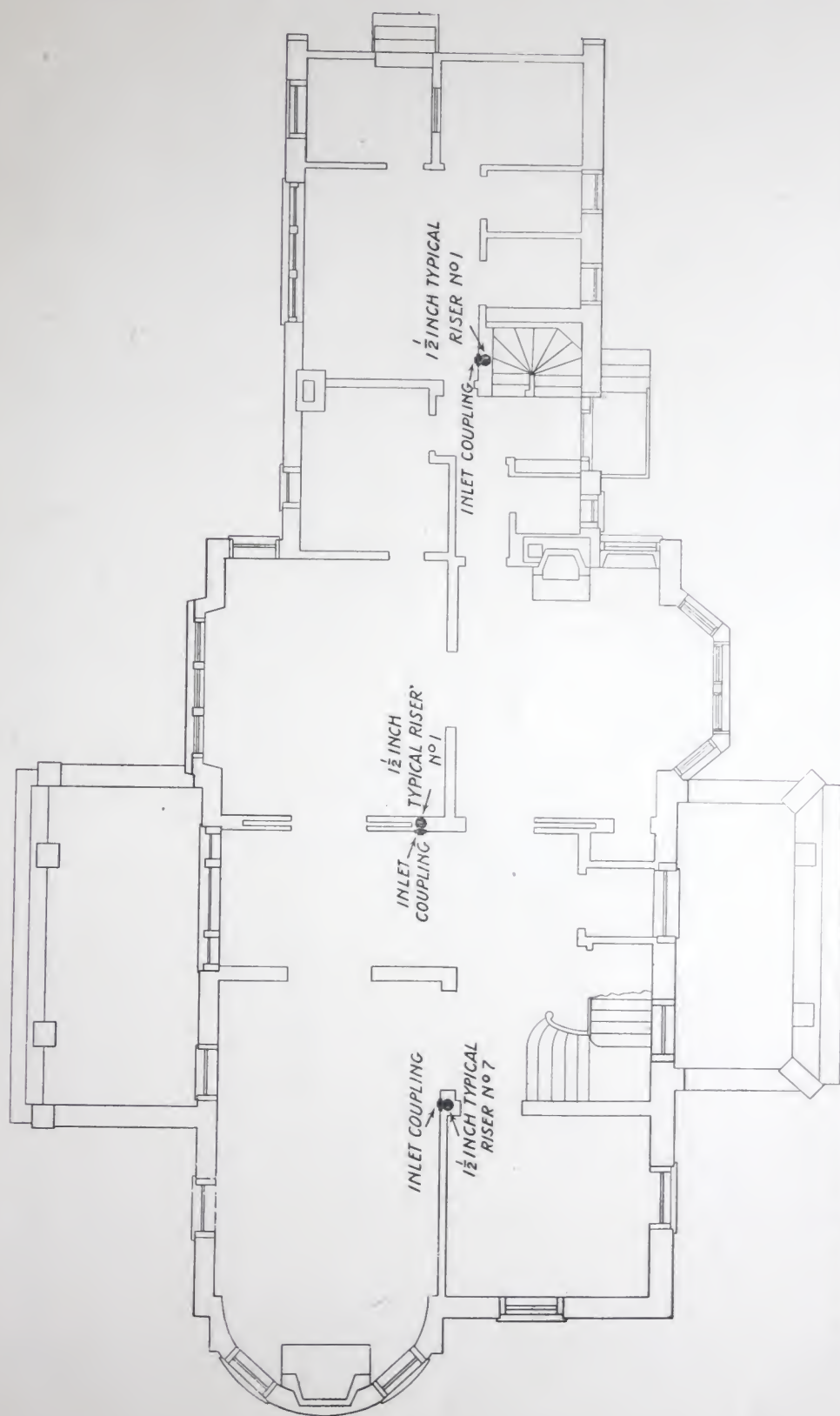
## Arco Wand Vacuum Cleaners—Installation for Residence



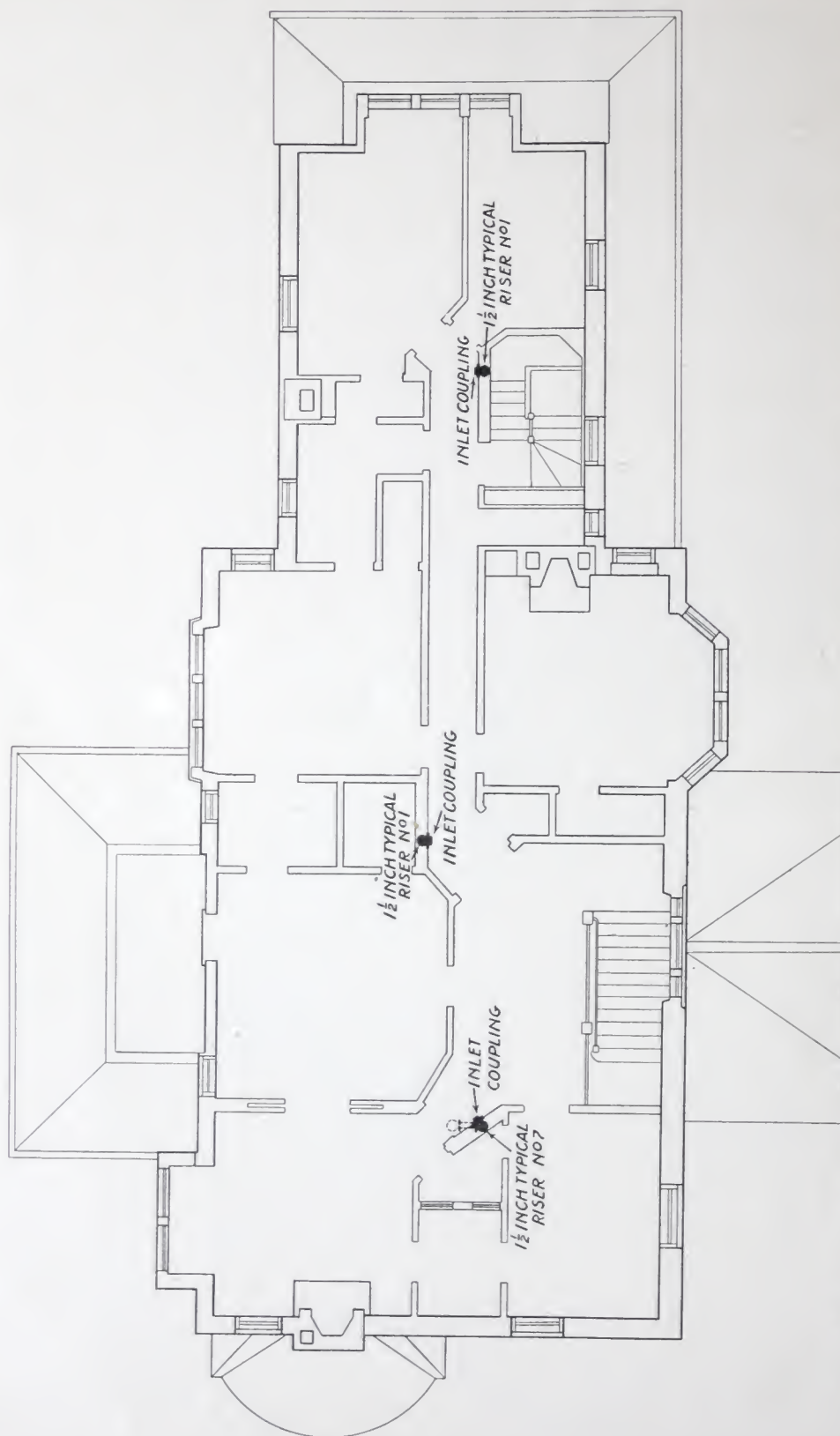
Basement plan of residence 38 x 96 feet. Shows location of Arco Wand Vacuum Cleaner and plan of piping. Three Inlet Couplings for hose connections make it possible to reach all parts of the basement with 35 feet of hose.



# *Arco Wand Vacuum Cleaners—Installation for Residence*



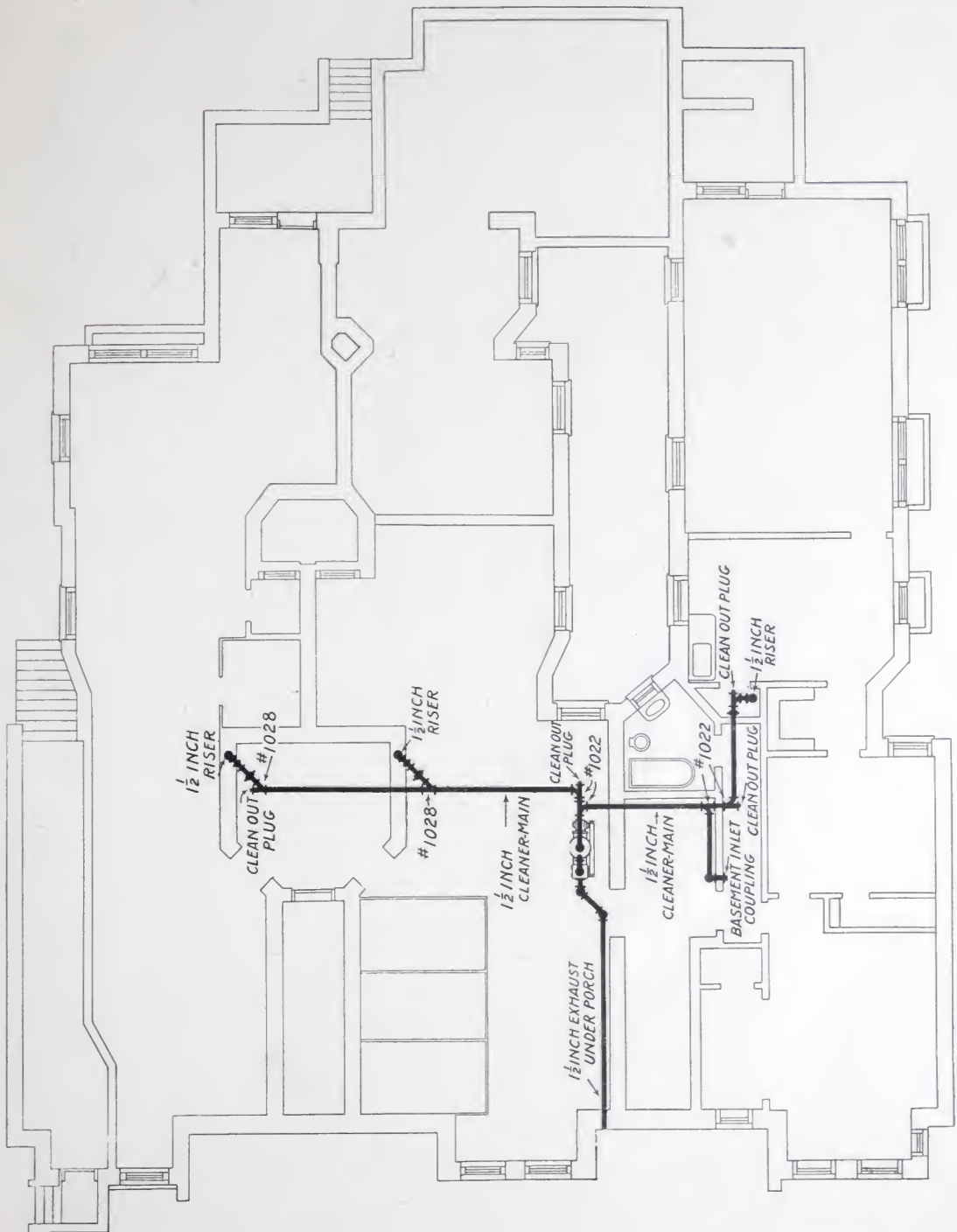
First floor plan of residence 38 x 96 feet. Three Inlet Couplings for hose connections make it possible to reach all parts of this floor with 35 feet of hose.



Second floor plan of residence 38 x 96 feet. Three Inlet Couplings for hose connections make it possible to reach all parts of this floor with 35 feet of hose.



## *Arco Wand Vacuum Cleaners—Installation for Apartments*

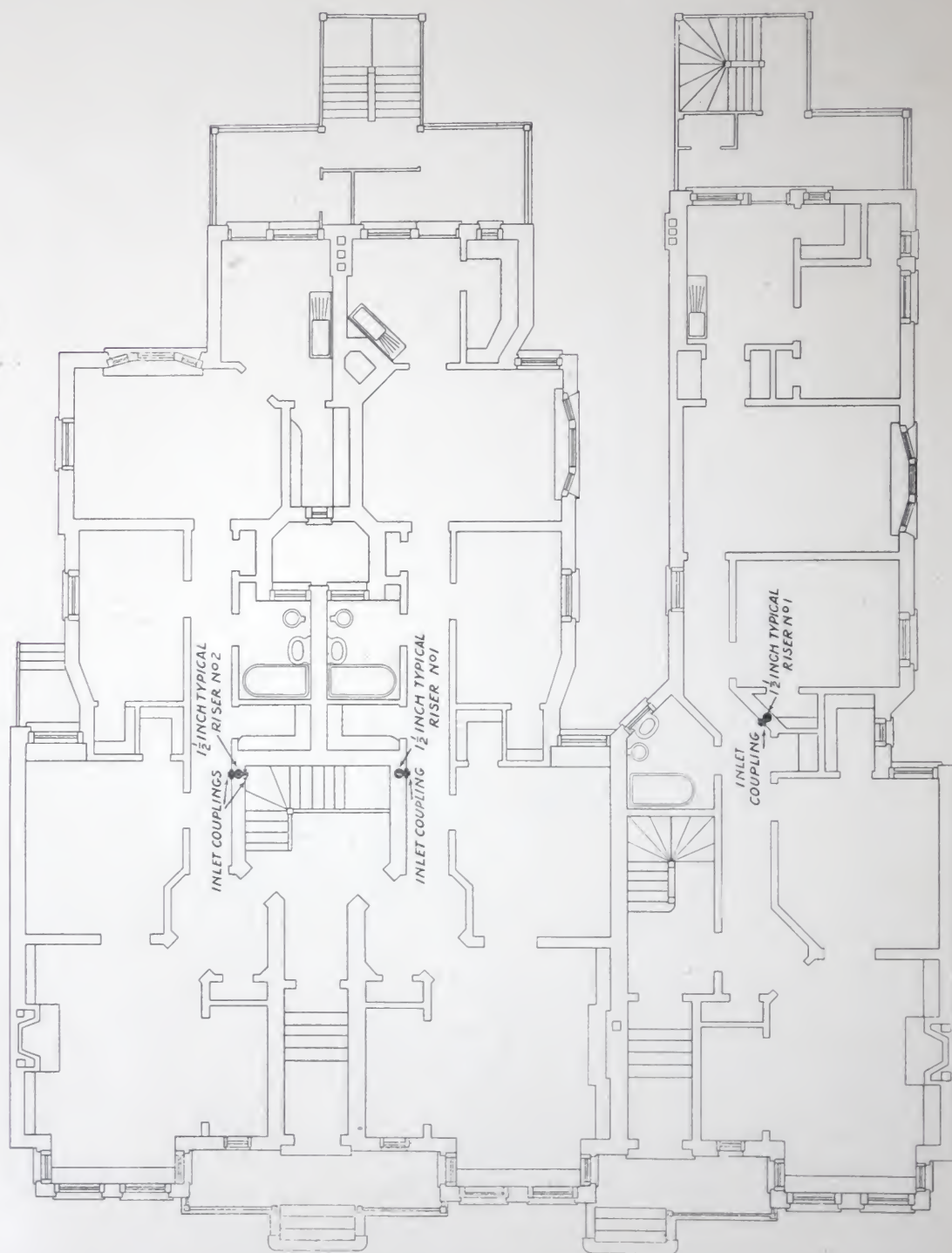


Basement plan of a 9-Apartment Building, 75 x 80 feet. Shows location of Arco Wand Vacuum Cleaner and plan of piping. One Inlet Coupling for hose connection for cleaning janitor's apartment is provided.

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*Arco Wand Vacuum Cleaners—Installation for Apartments*

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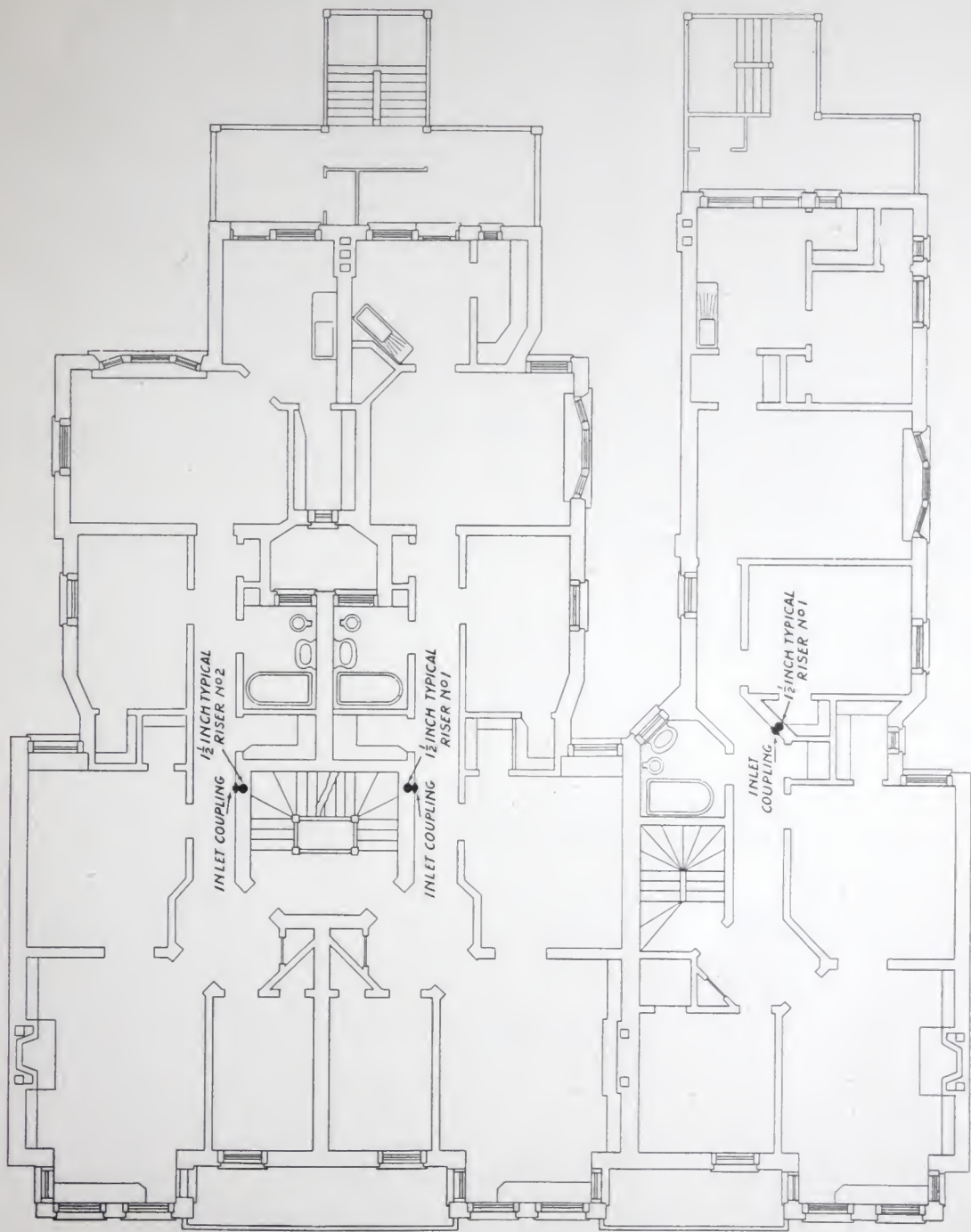
First floor plan of a 9-Apartment Building, 75 x 80 feet. Three Inlet Couplings for hose connections make it possible to reach all parts of this floor with 50 feet of hose. An additional Inlet Coupling is provided in the entrance hall, so that it can be cleaned without entering any apartment.



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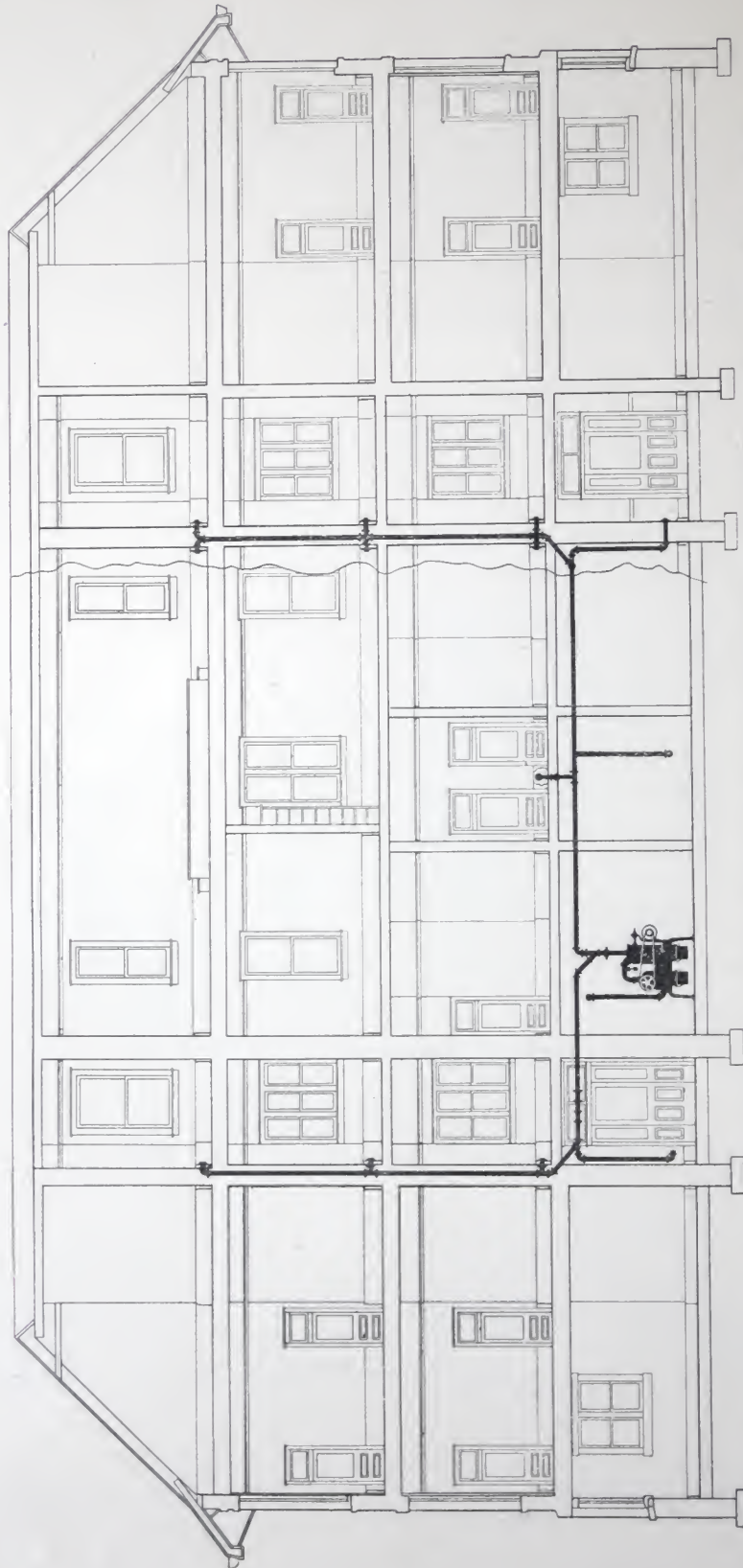
*Arco Wand Vacuum Cleaners—Installation for Apartments*

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Second and third floor plan of a 9-Apartment Building, 75 x 80 feet. Three Inlet Couplings on each floor make it possible to reach all parts of each floor with 50 feet of hose.

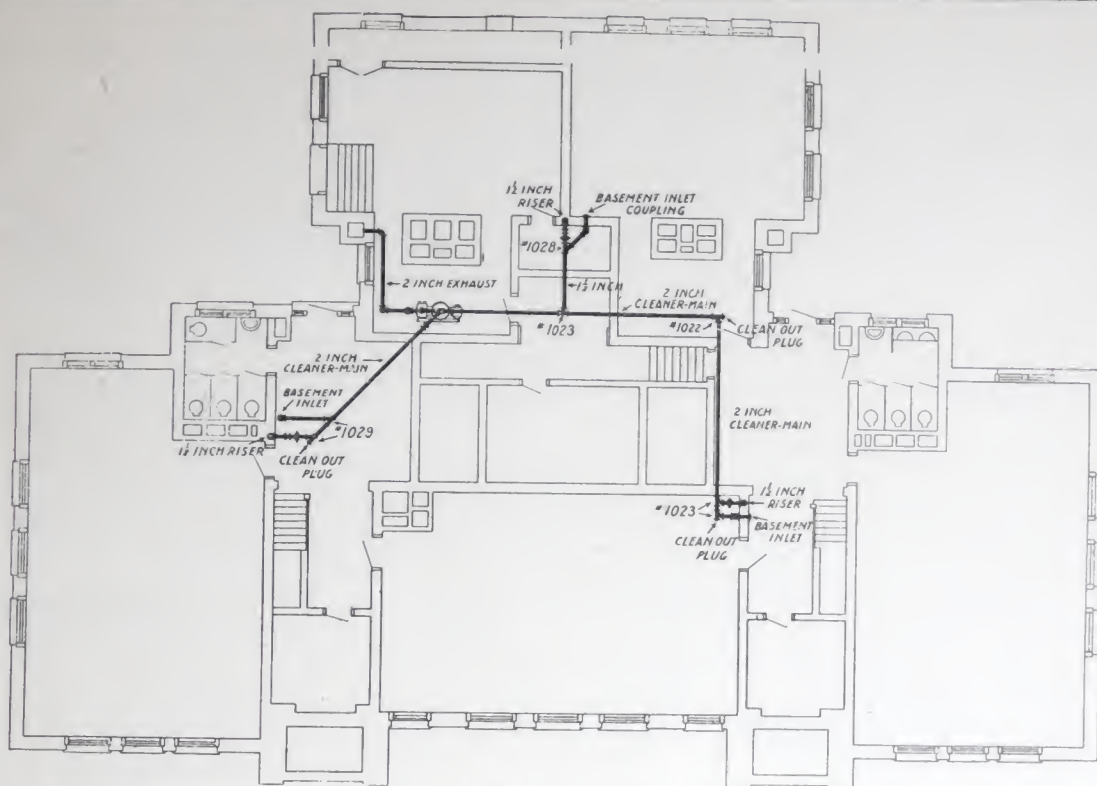
*Arco Wand Vacuum Cleaners — Installation for School*



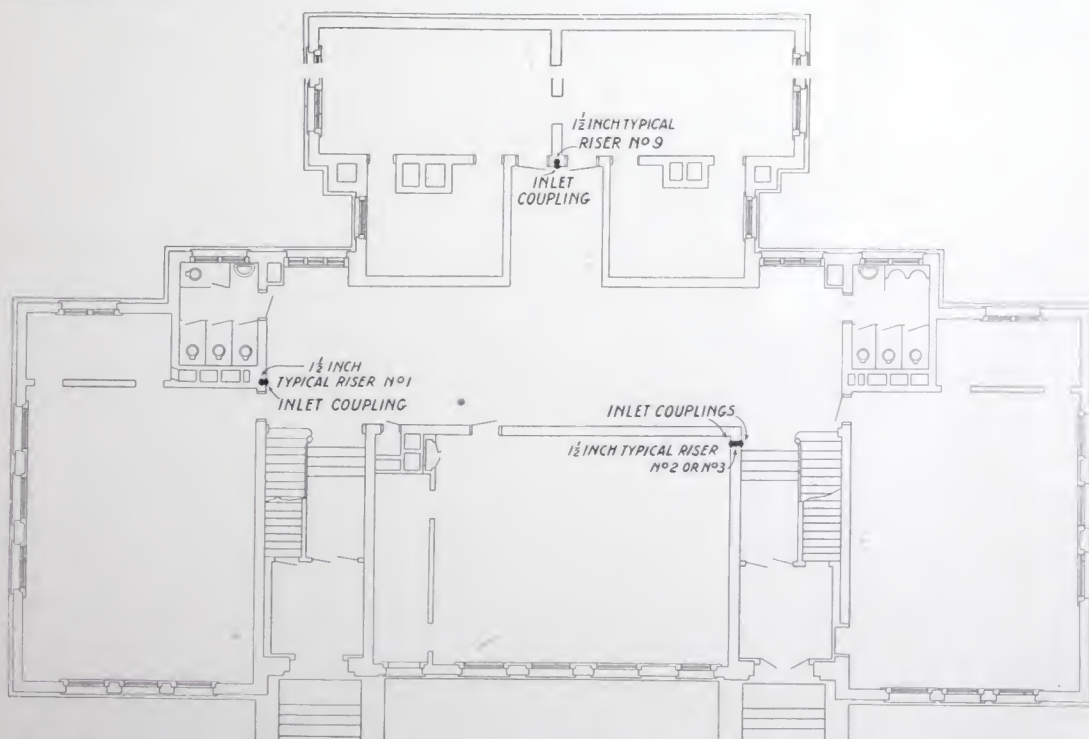
Sectional view of 15-room School House, 92 x 117 feet. Shows Arco Wand Vacuum Cleaner, Cleaner-mains, and Risers, with Inlet Couplings.



## Arco Wand Vacuum Cleaners—Installation for School

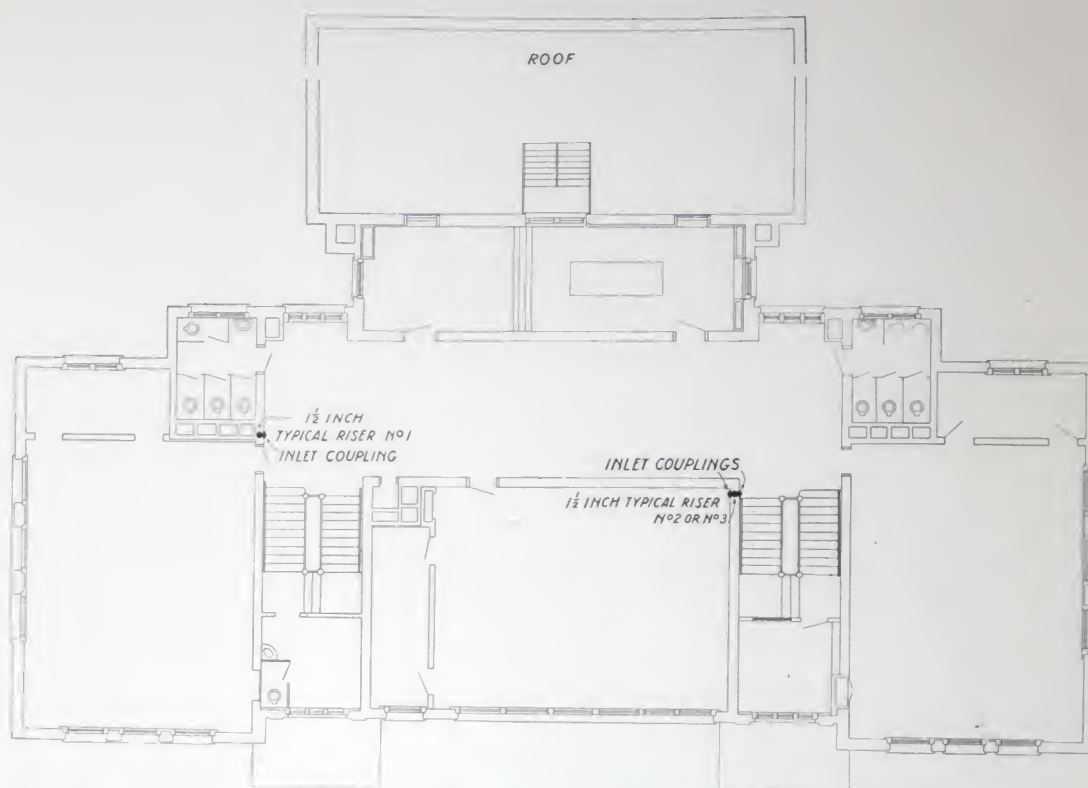


Basement plan of 15-room School House, 92 x 117 feet. Shows location of Arco Wand Vacuum Cleaner and plan of piping. Three Inlet Couplings for hose connections make it possible to reach all parts of the basement with 50 feet of hose.

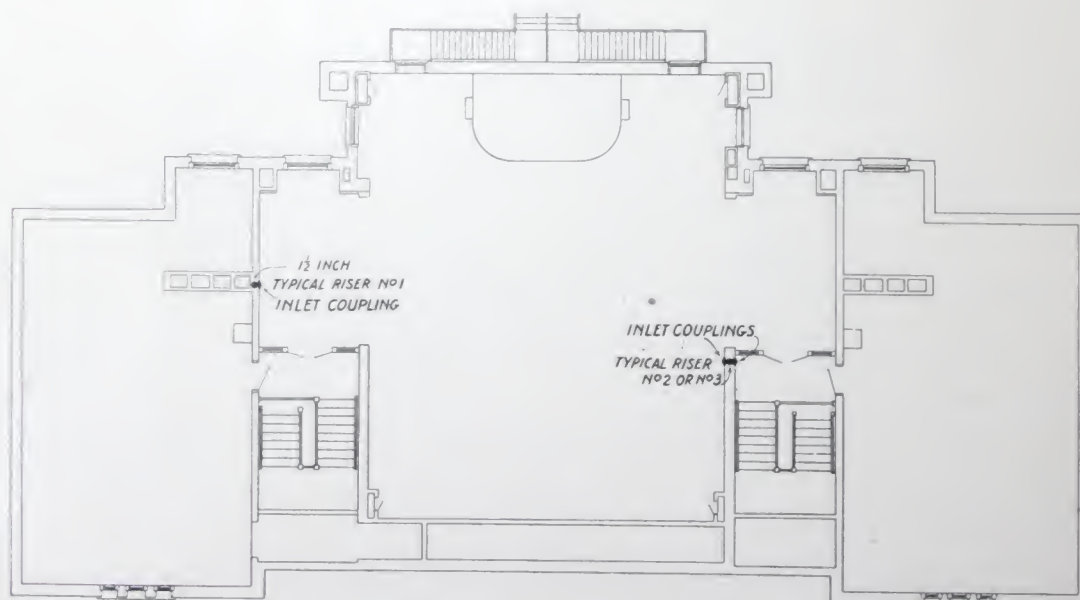


First floor plan of 15-room School House, 92 x 117 feet. Four Inlet Couplings for hose connections make it possible to reach all parts of this floor with 50 feet of hose.

## Arco Wand Vacuum Cleaners—Installation for School



Second floor plan of 15-room School House. Three Inlet Couplings make it possible to reach all parts of this floor with 50 feet of hose.



Third floor plan of 15-room School House. Three Inlet Couplings make it possible to reach all parts of this floor with 50 feet of hose.



## Electric Current for Arco Wand Vacuum Cleaners

In ordering Arco Wand Vacuum Cleaners definite information regarding the electric current for use with each machine is required. We suggest that the following form of letter or return postal card be addressed to the electric light or power company furnishing the current, with the request that it be filled in and returned:—

Date \_\_\_\_\_ 191 \_\_\_\_\_

We will furnish for operating \_\_\_\_\_ H. P. Electric Motor to be used on the premises of  
(Name of owner) \_\_\_\_\_

(Number and street) \_\_\_\_\_

(City and state) \_\_\_\_\_

(a) Direct current \_\_\_\_\_ Volts

(b) Alternating current \_\_\_\_\_ Volts \_\_\_\_\_ phase \_\_\_\_\_ cycles

NOTE:—Cross out (a) or (b) as occasion requires.

Signed, \_\_\_\_\_

NOTE:—You should fill in the horse-power of the motor, the name of the owner of the building and address. The electric light or power company will fill in the balance.

## Instructions for Ordering

Order Arco Wand Vacuum Cleaners by number.

If electricity is used for power, state whether the current is *Direct* or *Alternating*.

If Direct Current is used give voltage.

If Alternating Current is used give voltage, phase and cycles.

## Remote Control Switch Panels

These panels (see price list under Extra Electrical Equipment) are designed especially for use in connection with the remote control of Arco Wand Vacuum Cleaner Plants. They are installed as illustrated in wiring diagrams, with remote control, pages 30 to 33. Any number of snap switches can be located at convenient points about the building. The Vacuum Cleaner motor can be started or stopped by the operation of any of these switches.

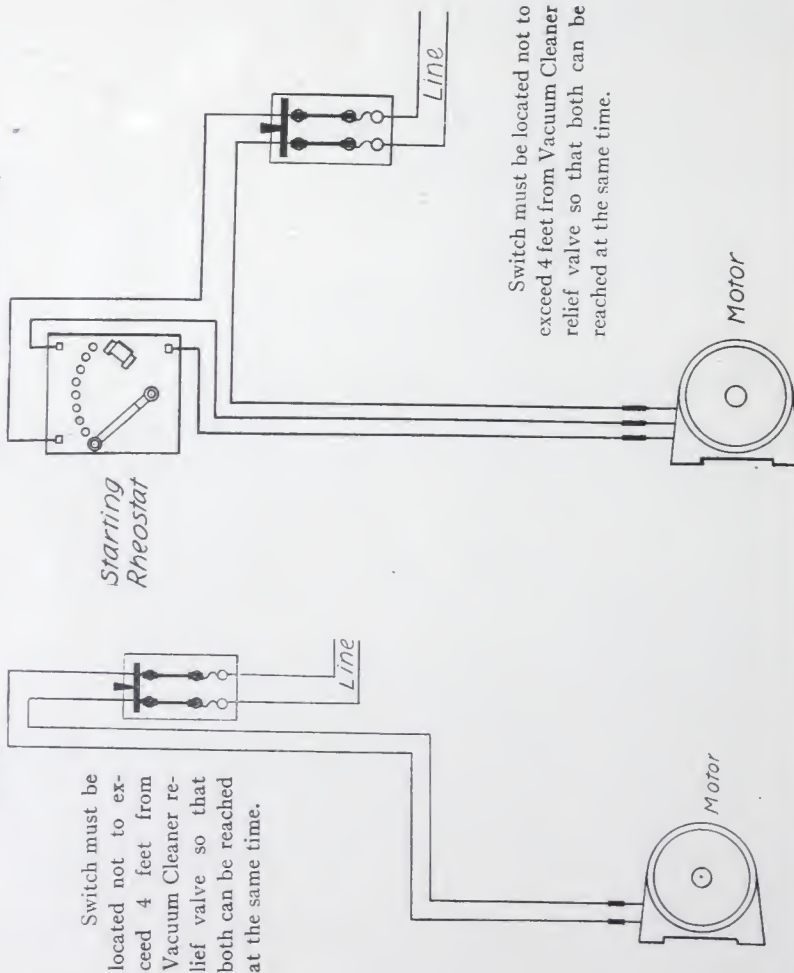
The panels are built for direct current or for alternating current, either single phase, two or three phase, 60 cycles, and for 110 or 220-volt circuits.

The remote control panel consists of a remote control switch, a fused knife switch to cut off the current from the Vacuum Cleaner wiring when required, and fuses to protect the control circuit. There are three sets of terminals, *i. e.*—LINE—MOTOR—CONTROL—plainly marked on the panel. It is, therefore, very easy to make electrical connections.

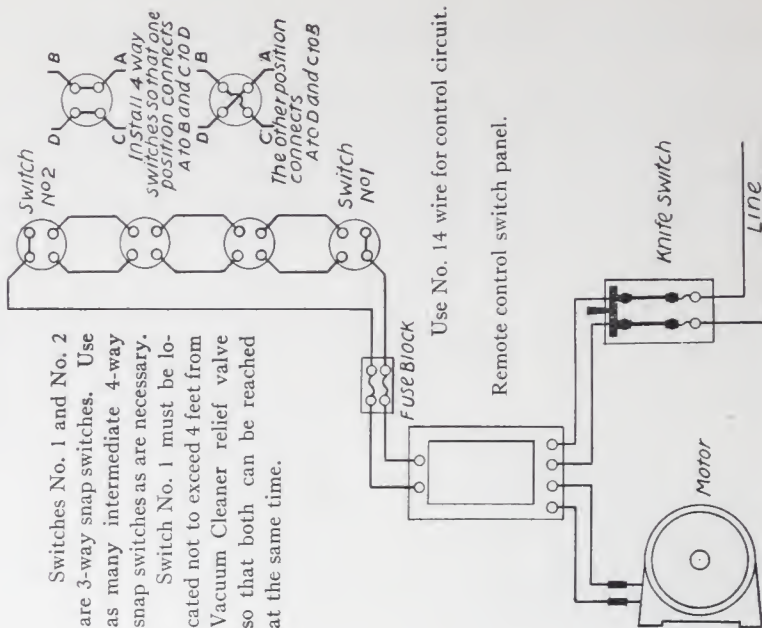
Steel cabinets (see price list under Extra Electrical Equipment) can also be furnished to completely enclose the panels when desired.

## Wiring Diagrams of Direct Current Installations

Without remote control  
(Using starting Rheostat)



With remote control



Switch must be located not to exceed 4 feet from Vacuum Cleaner relief valve so that both can be reached at the same time.

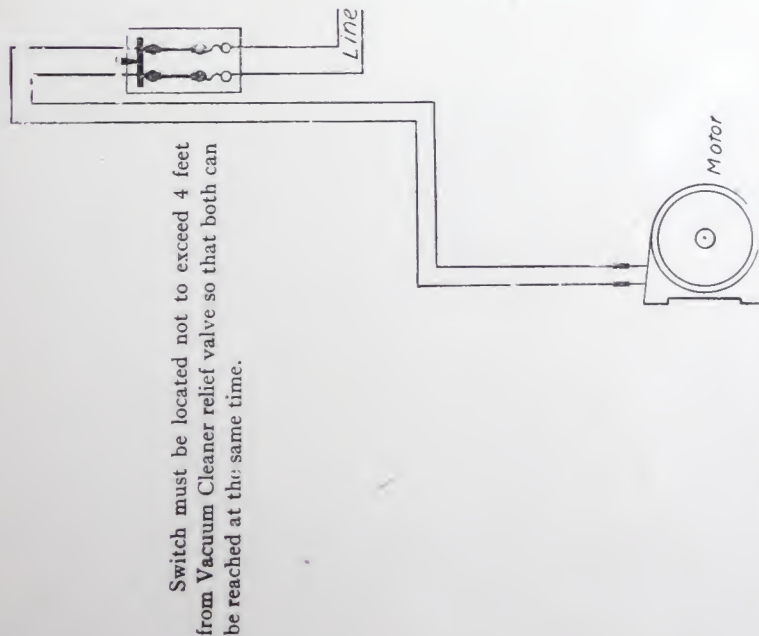
Horse-power	Wire Size		Horse-power	Wire Size	
	110 Volts	220 Volts		110 Volts	220 Volts
$\frac{3}{4}$	14	14	$\frac{3}{4}$	14	14
$1\frac{1}{2}$	10	14	$1\frac{1}{2}$	10	14
2	10	14	2	10	14

NOTE: Local Inspector should approve before work is started.



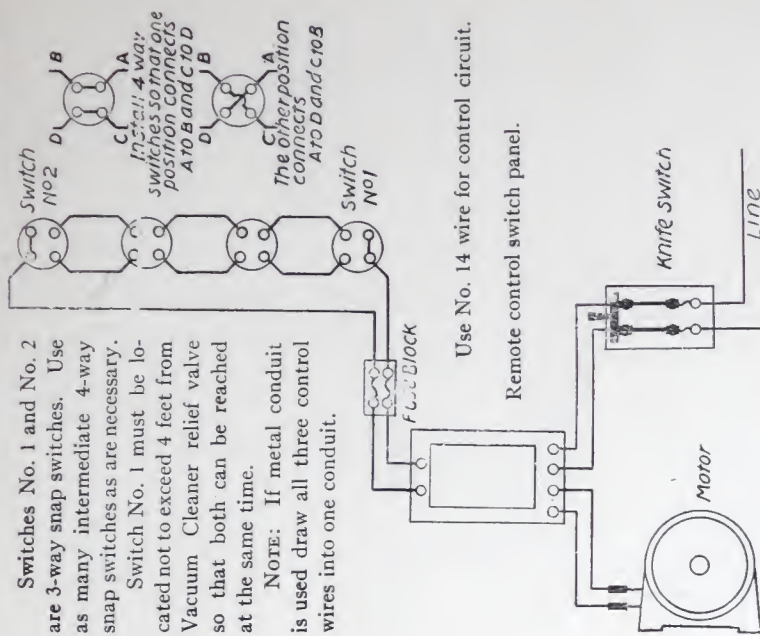
## Wiring Diagrams of Alternating Current Single-Phase Installations

### Without remote control



Horse-power	Wire Size	
	110 Volts	220 Volts
$\frac{3}{4}$	12	14
$1\frac{1}{2}$	8	12
2	8	10

### With remote control

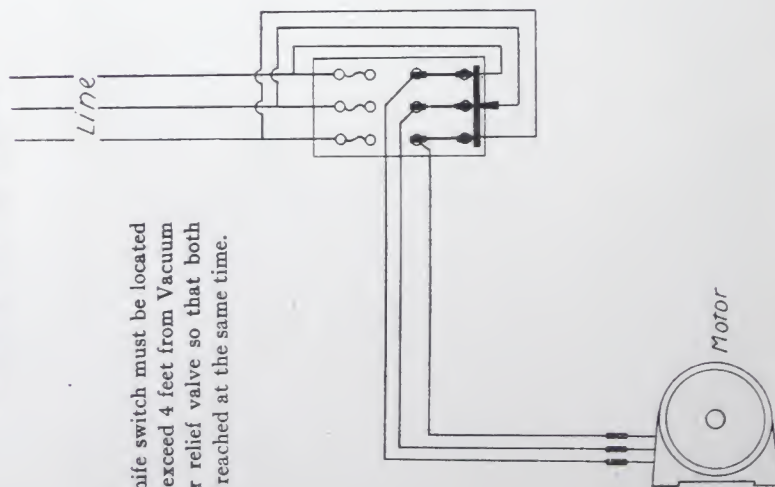


Horse-power	Wire Size	
	110 Volts	220 Volts
$\frac{3}{4}$	12	14
$1\frac{1}{2}$	8	12
2	8	10

**NOTE:** Local Inspector should approve before work is started.

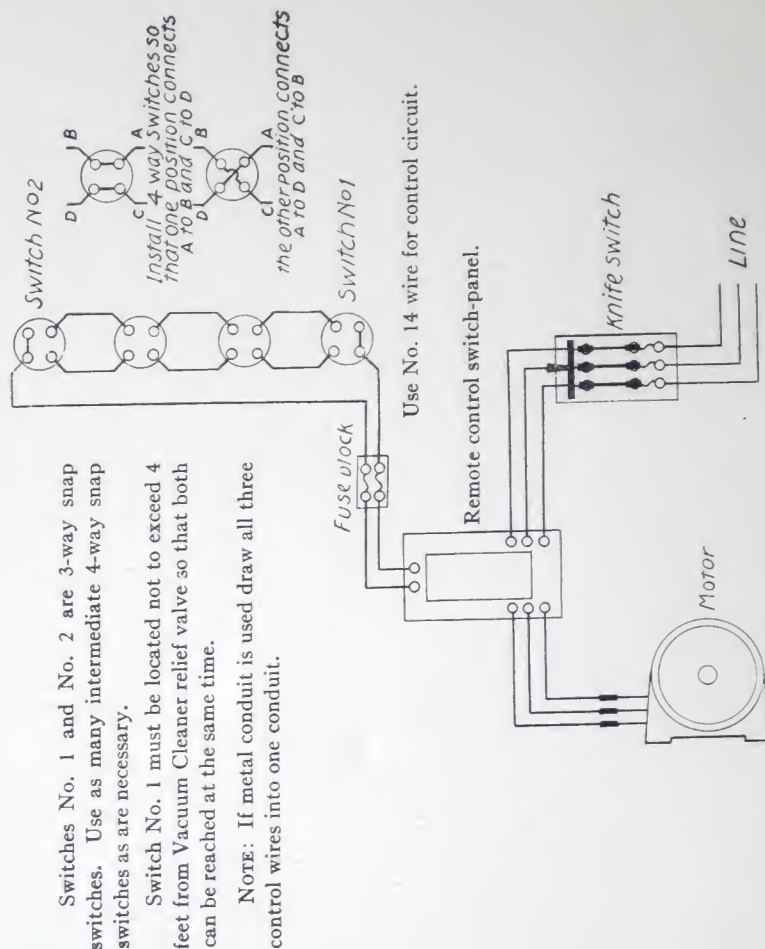
## Wiring Diagrams of Alternating Current Three-Phase Installations

### Without remote control



Horse-power	Wire Size	
	110 Volts	220 Volts
$\frac{3}{4}$	14	14
$1\frac{1}{2}$	12	14
2	10	12

### With remote control



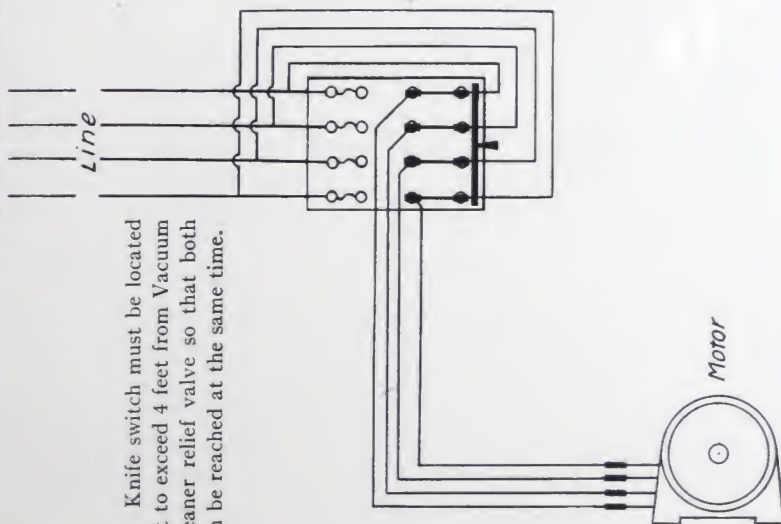
Horse-power	Wire Size	
	110 Volts	220 Volts
$\frac{3}{4}$	14	14
$1\frac{1}{2}$	12	14
2	10	12

NOTE: Local Inspector should approve before work is started.



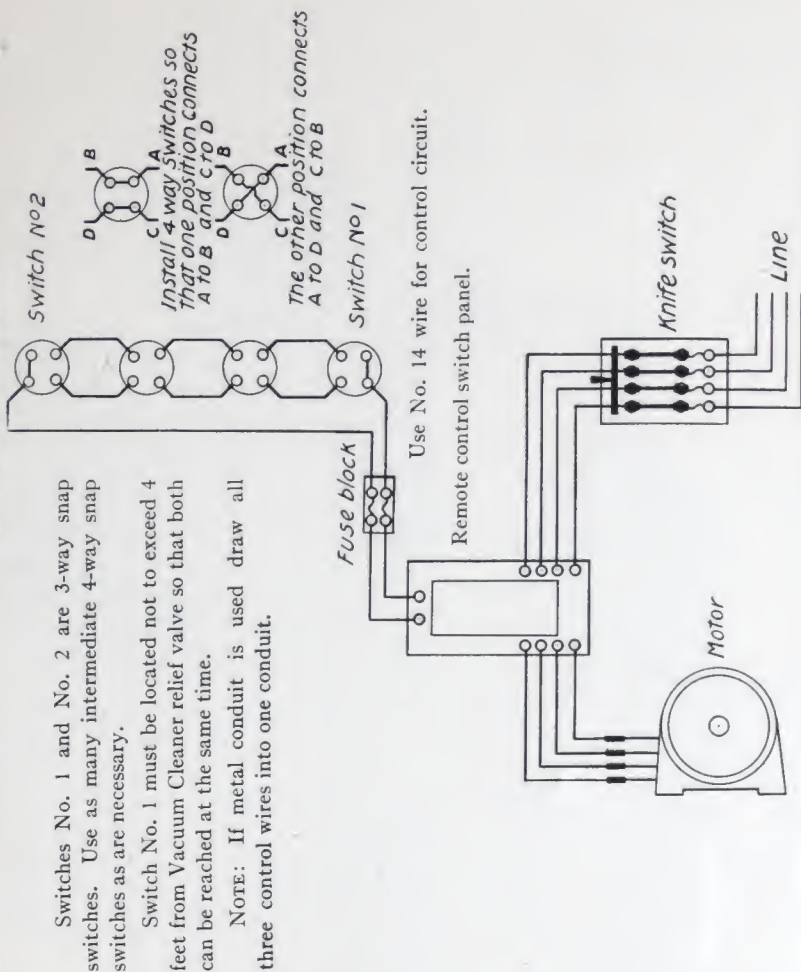
## Wiring Diagrams of Alternating Current Two-Phase Installations

### Without remote control



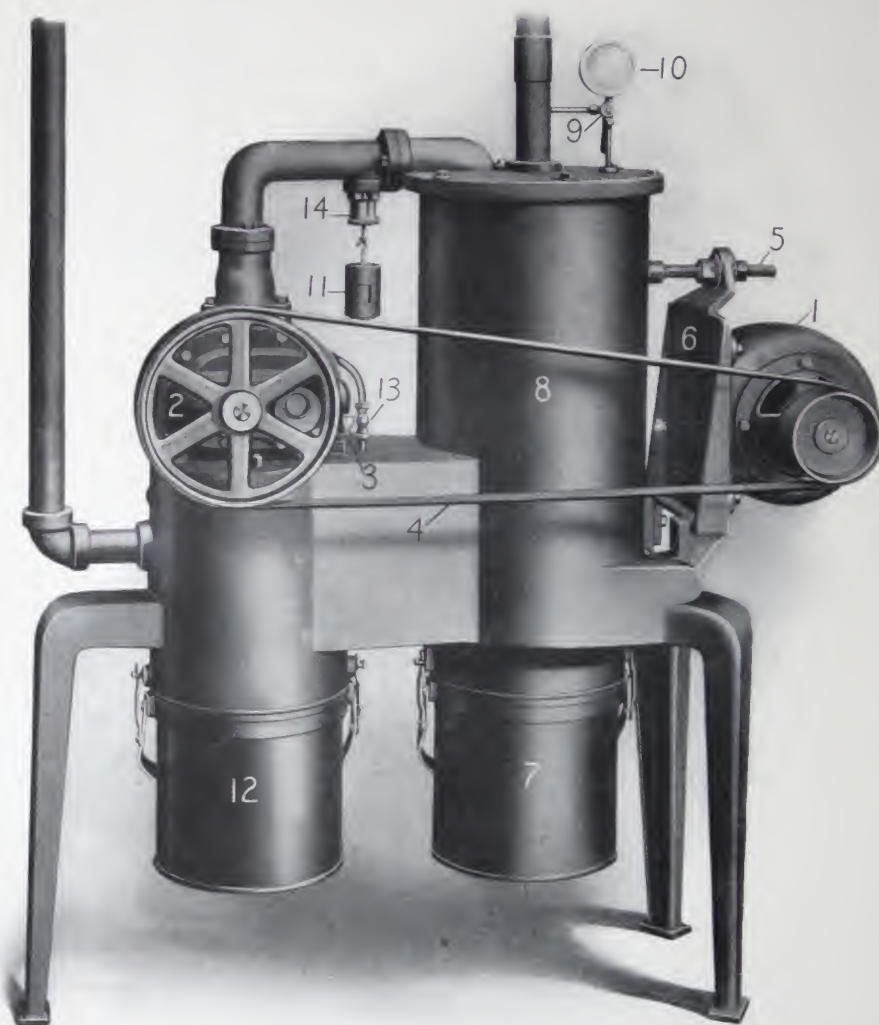
Horse-power	Wire Size	
	110 Volts	220 Volts
$\frac{3}{4}$	14	14
$1\frac{1}{2}$	12	14
2	10	12

### With remote control



Horse-power	Wire Size	
	110 Volts	220 Volts
$\frac{3}{4}$	14	14
$1\frac{1}{2}$	12	14
2	10	12

NOTE: Local Inspector should approve before work is started.



*Arco Wand Vacuum Cleaner No. 351—Rear View*

### Oiling

Use good quality Dynamo Oil. Raise the hinged cover at each end of the Electric Motor (1) and pour in oil until it appears at the small test opening. Raise the hinged cover at one end of pump (2). Also raise the cover of the oil cup (3), which communicates with the same oil cistern. Pour oil into the cistern until it nearly reaches the top of the oil cup. Repeat the operation at the other end of the pump (2). Supply the gears and gear-chamber of the pump (2) with heavy oil. There are five places to oil, including the gears. After oiling, see that all hinged covers are closed.

After the oil cisterns are once filled, a small amount of oil poured in occasionally keeps the supply replenished.



## *Arco Wand Vacuum Cleaners—General Directions*

Before starting the first time see that the machine is oiled. Turn the machine by hand and be sure that the four brass oil rings on the pump (2) and the two brass oil rings on the motor (1) revolve with the shafts, carrying oil up from the oil cisterns to the shafts.

### **Belt (4)**

The Belt (4) should be reasonably tight, not too tight, or it may cause the bearings to heat.

To tighten the belt (4), loosen the outer nut on the bolt (5) and then turn the inner nut on the bolt (5) forcing the motor bracket (6) outward.

### **Dust Bucket (7)**

Remove and empty the Dust Bucket (7) when full, or as often as necessary. To detach the Dust Bucket (7), lift up the handle, causing the Bucket (7) to swing on the two side hooks. With both hands grasp the handle near the hooks, and with an upward pressure disengage with the fingers the hooks from the studs on which they hang. (See illustration.)

To replace the Dust Bucket (7), with both hands grasp the handle near the hooks. With the forefingers and thumbs apply the hooks to the studs (see illustration). Then push down on the handle causing the Bucket (7) to draw up into place.

### **Testing the Condition of the Screen in Separator (8)**

Attach a length of hose to any inlet coupling, all others being closed. Place the handle of the gauge cock (9) in a horizontal position, pointing toward the cleaner-main. (See illustration.) Start the machine and observe the vacuum registered on the gauge (10). While the machine is still running, turn the handle of the gauge cock to a vertical position, pointing downward. (See illustration.) If the vacuum as registered on the gauge (10) rises one inch or more, then the screen should be cleaned.

### **Cleaning the Screen**

Remove the hose used in testing the condition of the screen. Make sure all inlet couplings are closed. Start the machine. With the hand press down on



*Removing or Replacing Dust Bucket*

tion, pointing toward the cleaner-main. (See illustration.) Start the machine and observe the vacuum registered on the gauge (10). While the machine is still running, turn the handle of



*Gauge-cock—handle in horizontal position*



*Gauge-cock—handle in vertical position*

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## *Arco Wand Vacuum Cleaners—General Directions*

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the weights (11). When the gauge (10) registers 12 inches of vacuum, stop the machine by operating the electric switch within reach of the machine, at the same time continuing to press down on the weights (11). When the machine stops, quickly raise with the hand the weights (11). Repeat three or four times. This causes currents of air to pass through the Screen in reverse direction, resulting in blowing off the dust and dirt which adheres to the Screen.

Clean the Screen as often as found necessary after testing.

### **Filling and Cleaning the Water Bucket (12)**

Remove the Water Bucket (12) in the same manner as the Dust Bucket (7). (See illustration page 35.) Empty and wash out. Refill the Bucket (12) with water, in the usual manner, to within one or two inches of the top. Replace the Bucket (12) in the same way as the Dust Bucket (7). (See illustration page 35.)

It is not necessary to refill the bucket (12) until the water is lowered to within four inches of the bottom. If at any time the vacuum registered on the gauge (10) seems to be less than usual, see if bucket (12) does not need refilling. The valve (13) should always be open when water is circulated through pump (2) from the bucket (12). If the machine is to stand idle for a considerable length of time, it is well to empty all water from the Water Bucket (12) and then run the machine for several minutes. This will dry out the pump (2).

If the machine is located in a place where it is liable to freeze, it should be operated without water and Valve (13) should be closed.

### **Vacuum Relief Valve (14)**

The Vacuum Relief Valve (14) is of the weighted type. Adjust the weights (11) according to the suction desired. Each weight is marked with a number showing the vacuum in inches, mercury column, which it represents. The vacuum will not exceed the amount represented by the weights attached to the Relief Valve (14).



*Water Bucket in position for inspection*



*Vacuum Relief Valve—Adjusting Weights*



### **Stoppage in Piping**

If a stoppage occurs in the piping, locate it as nearly as possible by operating the machine and testing the suction at the inlet couplings. All inlet couplings being closed, first open the one nearest the machine and test the suction with the hand. If there is practically no suction, the obstruction is between this opening and the machine. If the suction is normal, make the test at each of the other inlet couplings in regular succession until the obstruction is located. The obstruction can be removed by means of a wire with a hooked end shoved through the pipe. The wire can be entered at an inlet coupling or a plugged opening in the piping provided for the purpose. Electrician's fishing steel wire is recommended for the purpose.

### **Stoppage in Hose**

If the vacuum hose becomes clogged, first reverse the air current through the hose in order to remove the obstruction. To do this attach one end of the 14-inch Wand Extension Handle to the vacuum hose, insert the other end in any inlet coupling and start the machine. Second, if the air current should fail to remove the obstruction, it will be necessary to use a long rod to remove the trouble. Third, if these two simple remedies do not give results the hose probably has become defective and must be renewed.

### **Cleaning Couplings**

As often as necessary clean with a cloth dampened with gasoline, the inlet couplings, hose couplings and couplings attached to tools. The telescoping parts should be carefully wiped, removing any dust and dirt which may have adhered to them, preventing easy operation.

### **Fastening Coupling Parts into Ends of Hose**

Apply a single coat of thick shellac varnish (shellac dissolved in alcohol), to the inner surface of the hose for a distance of 2 inches from each end. Care should be taken to keep free from shellac the telescoping parts of the coupling. Push the beveled end of each half of the coupling into the hose up to the shoulder. Observe that one end of the hose is larger than the other and that one end of the coupling is larger than the other. Fit the parts together accordingly.

### **Electrical Connections and Fuses**

If at any time the motor on the Vacuum Cleaner does not start upon operating a switch: First, see that the knife switch near the machine is closed. Second, see if a fuse is burned out, and if so, replace it. If these simple remedies fail, consult an electrician.

### **Replacing Fuses**

There are two fuses in the fuse cabinet from which the wires lead out to the motor of the Vacuum Cleaner. Either one or both of these fuses may be burned out. If the fuse is cartridge type, an indicator on its surface will show by a burned appearance that the fuse is burned out. If the fuse is plug type, its condition can be seen through the small mica window in the top.

Before replacing burned out fuses it is advisable, if possible, to open the main switch, cutting current off from the building. New fuses may then be put in place, after which the main switch should be closed. This procedure will prevent accident to the attendant.

## Proposal and Contract

Proposal By \_\_\_\_\_

### For Installation of Arco Wand Vacuum Cleaner

To \_\_\_\_\_

For the sum of \_\_\_\_\_ payable \_\_\_\_\_

I propose to furnish and install in \_\_\_\_\_  
located in \_\_\_\_\_ one ARCO WAND VACUUM CLEANING PLANT,  
under the conditions herein specified, and consisting of the following:

#### Equipment

- |                                                                                                  |                                  |
|--------------------------------------------------------------------------------------------------|----------------------------------|
| 1—No. _____ Arco Wand Vacuum Cleaner, the motor to be _____ H. P. _____ current.                 |                                  |
| _____ feet of 1-inch Vacuum Hose equipped with Arco couplings, consisting of _____ foot lengths. |                                  |
| 1—1-inch Renovator and Tuft Cleaner.                                                             | 1—Duster.                        |
| 1—4-inch Renovator.                                                                              | 1—40-inch Wand Extension Handle. |
| 1—10-inch Renovator.                                                                             | 1—36-inch Wand Extension Handle. |
| 1—Floor Brush.                                                                                   | 1—Case for Tools.                |
| 1—Felted Sweeper (underbed type).                                                                | _____ Inlet Couplings.           |
| 1—Felted Sweeper (underneath type).                                                              |                                  |

#### Foundation

A suitable foundation for the machine to be provided.

#### Electrical Connections

All necessary electrical connections to the motor to be made. Snap switch \_\_\_\_\_ of \_\_\_\_\_  
\_\_\_\_\_ pattern will be located as follows:  
Basement, one, within reach of the machine, \_\_\_\_\_,  
First Story \_\_\_\_\_, Second Story \_\_\_\_\_.  
It will be arranged so the machine can be started or stopped by operating any switch.

#### Piping

A system of piping of suitable diameter for conveying dirt-laden air, consisting of \_\_\_\_\_  
\_\_\_\_\_ riser . . . and necessary horizontal mains connecting the riser . . . with the Vacuum Cleaner  
to be installed. The exhaust pipe from the Vacuum Cleaner to be carried into a vent flue or to an  
unobjectionable point outside the building. The pipe used to be of standard weight, having smooth  
inside surface, free from dents, kinks, fins or burrs. The ends of all pipe to be squared and reamed  
smooth to the full inside diameter.

#### Fittings

All fittings to be gray cast iron, free from defects, having inside diameter through body of  
same size as pipe bore. Where space permits, long turn tees and elbows to be used.



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*Arco Wand Vacuum Cleaners—Form of Contract*

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### Hangers

Horizontal overhead pipes to be supported by suitable pipe hangers, spaced not more than twelve feet apart.

### Cleanout Plugs

Cleanout plugs, of same size as pipe, to be provided in horizontal mains at turns and at base of risers.

### Inlet Couplings

The following openings equipped with inlet couplings to be furnished:

Basement \_\_\_\_\_, First Story \_\_\_\_\_, Second Story \_\_\_\_\_

### Decorating

All exposed piping in finished rooms to be decorated with paint or bronze.

### Guarantee

I guarantee the apparatus and equipment to be of the best workmanship, and any part proving defective in manufacture within one year will be replaced free, with the exception of the hose, which is only guaranteed to be perfect as far as workmanship and material are concerned upon delivery. I further guarantee the plant when properly operated to do good and efficient cleaning.

Respectfully submitted,

Signed \_\_\_\_\_

Dated at \_\_\_\_\_, \_\_\_\_\_ 191 \_\_\_\_\_

The foregoing proposal, with its specifications, terms and conditions, is satisfactory, and is hereby accepted.

Signed \_\_\_\_\_

Date \_\_\_\_\_ 191 \_\_\_\_\_

No. \_\_\_\_\_

**PROPOSAL and CONTRACT**  
FOR INSTALLATION OF  
**Arco Wand Vacuum Cleaner**

By \_\_\_\_\_

To \_\_\_\_\_

Dated \_\_\_\_\_

191 \_\_\_\_\_





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